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March 10, 1995

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C 20555

Subject: Discovery of Personnel Contamination During Pre-Badging Whole Body Count Screening

The purpose of this letter is to forward a copy of a letter dated March 7, 1995, from Southern California Edison to an individual, who has never entered the San Onofre Nuclear Generating Station, who arrived at San Onofre with an apparent internal presence of Zinc-65. Because the individual stated to Edison personnel that he had no knowledge of exposure to radioactive materials, we are providing a copy of our letter to the individual and the whole body count results.

In accordance with the provisions of 10CFR2.790 (a)(6), Edison respectfully requests that this submittal be withheld from public disclosure as it contains medical files, the disclosure of which could involve personal privacy.

If you have any questions, or require additional information, please contact Mr. Peter Knapp, Manager of Health Physics at the San Onofre Nuclear Generating Station.

Sincerely,

Walter C. Marsh

cc: NRC Region IV
NRC Resident, SONGS
CDM

Exempt from Public Disclosure - 10CFR2.790 Information
Decontrolled Upon Removal of Attachment

200028

A001
1/1

UNIT 1 CONTAINMENT

The Unit 1 Containment is a steel sphere which houses the reactor, the steam generators, the reactor coolant pumps, the reactor coolant system and other required support systems. Containment is a single fire area.

The Unit 1 Containment contains components and/or cabling for the following systems, which can be used to achieve, maintain, or support safe shutdown:

- Reactor Coolant
- Volume Control and Charging
- Main Steam
- Residual Heat Removal
- Component Cooling Water
- Containment Ventilation
- Safety Injection
- Containment Spray and Recirculation
- Feedwater

The types of fire suppression/detection equipment in or near containment consist of the following:

- Portable extinguishers
- Manual hose stations
- Heat, ionization, and infrared detectors

In addition, the containment spray system and a manual water spray system, supplied with borated water, are available to provide suppression capability inside containment.

Fire Area/Zone	Contains Safe Shutdown Equipment	Contains Safety Related Equipment Not Required for Safe Shutdown	Page No.	Figure No.
1-CO-(-10)-1	Yes	Yes	1/CO-1	8-A, 8-B

FIRE AREA/ZONE: 1-CO-(-10)-1

AREA: 15394 sq.ft. **DESCRIPTION:** CONTAINMENT

COMBUSTIBLES

Oil & Grease	5062 lbs.
Cable (30% Fill)	20721 lbs.
Class A	0 lbs.
Charcoal	1224 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	24158 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1450
Fire Duration	0.30 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	containment spray available
Hose Stations	(1)
Portable Extinguishers	(5)10B:C, (2)4A:40B:C, (3)10A:60B:C #
Detectors (Type)	heat, ionization, infrared

FIRE RESISTANCE RATING

- Walls	NR (steel)
- Floors, Ceiling or Roof	NR (steel)
- Fixed Openings	none
- Penetrations	NC/4B, 4A, NP/4B, ND/4B
- Doors(UL Class/Zone #)	(2)NR/9B, NR/4D

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant	1,2,3,(1)	1,3	1,2,(1)
Volume Control & Charging	2,3	1,2,3	2
Main Steam	1,2,J	3	1,2,J*
Auxiliary Feedwater			
Component Cooling Water	(1)	(1,3)	(1)
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation	1,2,3		1,2

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal	1,2	1,2,3	1,2
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)		(1)(2)(3)	(1)(2)(3)
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant	J		J*
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)		1	1

SUMMARY

EQUIPMENT	PIPING VALVES	CABLE
1,2,3,(1),J	1,2,3,(1,2,3)	1,2(1,2,3),J*

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			
SUMMARY			

SHUTDOWN SYSTEM CREDITED :Dedicated

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :Yes(SEE TEXT)
Spurious Operation :Yes(SEE TEXT)

NOTES

- (2)40B:C, (2)80B:C, (1)160B:C

Location

Containment - El. (-10'-0") - 15,394 square feet - Figs. 8-A, 8-B.

Combustible Material	Quantity
Oil	5,062 lbs
Cable insulation	20,721 lbs
Charcoal	1,224 lbs

Fire loading - 24,158 Btu/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - E/1450 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the average plant tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1450 °F and would involve oil, cable insulation, and charcoal.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

The containment spray system provides suppression capability outside the secondary shield wall. Borated water from the containment spray piping is also supplied to the water spray systems at the reactor coolant pumps and the residual heat removal pumps. A fire department conection to the borated water supply provides the capability for fire fighting apparatus to suppply fire water for use in hose stations and/or the spray system. These systems are operated manually, if available, from the control room. Ionization smoke detectors, fixed temperature rate compensated heat detectors, and infrared flame detectors are located in hazard areas to provide early warning alarm in the ESO office and the control room. A hose station utilizing borated water is available on the operating deck. Additional manual fire fighting equipment is also available within the area.

Construction

The area is bounded by the steel containment sphere. A nonrated equipment hatch, and a nonrated personnel escape hatch communicate with adjacent zone 1-TB-35-9B. A second personnel escape hatch opens to the yard area (1-YD-14-4D.) Reinforced concrete structures (cavities) are located within containment and they house the steam generators.

Equipment Required for Hot Standby

Reactor Coolant System (RCS):

Train 1:
- PORV: CV-545, CV-546
- Block Valve: CV-530, CV-531
- Cold Leg Temperature: TE-402C, TE-3412C, TE-422C
- Hot Leg Temperature: TE-2401A, TE-2412A, TE-2422A
- Pressurizer Level: LT-431
- Pressurizer Pressure: PT-430, PT-431
- Source Range Monitor: NE-1201, NE-1202
- Pressurizer Heater Group A & C

Power cable: Pressurizer Heater Group A & C

Control cable: CV-545, CV-546, CV-530, CV-531

Instrumentation cable: TE-402C, TE-3412C, TE-422C, TE-2401A, TE-2412A, TE-2422A, LT-431, PT-430, PT-431, NE-1201, NE-1202

Equipment Required for Hot Standby (contd)

Reactor Coolant System (RCS) (contd):

Train 2: Pressurizer Heater Group B & D
Hot Leg Temperature: TE-3402A
TE-3411A
TE-3421A
Pressurizer Level LT-435
Pressurizer Pressure PT-425
Power cable: Pressurizer Heater Group B & D
Instrumentation cable: TE-3402A
TE-3411A
TE-3421A
LT-435
PT-425

Train 3: Reactor Vessel C-1*
Steam Generators: E-1A*
E-1B*
E-1C*
Pressurizer C-2
Piping and valves *

Volume Control and Charging (VCC):

Train 1: Piping and Valves
Train 2: Sealwater Return Control Valves: PCV-1115A
PCV-1115B
PCV-1115C
RCP Seal Flow Pressure: PT-1115A
PT-1115B
PT-1115C
Control cable: PCV-1115A
PCV-1115B
PCV-1115C
Instrumentation cable: PT-1115A
PT-1115B
PT-1115C

Train 3: Seal Supply Filter: C-952A
C-952B
C-952C
Piping and valves

(* Pressure boundary only)

Equipment Required for Hot Standby (contd)

Main Steam (MSS):

Train 1: S/G Level: LT-2400A
LT-2400B
LT-2400C
Instrumentation cable: LT-2400A
LT-2400B
LT-2400C

Train 2: S/G Level: LT-3400A
LT-3400B
LT-3400C
Instrumentation Cable: LT-3400A
LT-3400B
LT-3400C

Train 3: Piping and valves

Containment Ventilation (CVS):

Train 1: Fan A-9
Damper PO-11
Power cable: A-9
Control cable: A-9
PO-11

Train 2: Fan A-9S
Damper PO-12
Power cable: A-9S
Control cable: A-9S
PO-12

Train 3: Temperature Switch TS-24

Equipment Required for Cold Shutdown

Residual Heat Removal (RHR):

Train 1: Pump G-14A
Heat Exchanger E-21A
Inlet Isolation MOV-813
Discharge Isolation MOV-833
Heat Exchanger Inlet MOV-822A
Heat Exchanger Inlet Temperature TE-600
Heat Exchanger Disch. Temperature TE-601A
TE-601B
Flow Control Valve HCV-602
Power cable: G-14A
MOV-813
MOV-833
MOV-822A
Control Cable: MOV-813
MOV-833
MOV-822A
HCV-602
Instrumentation cable: TE-600
TE-601A
TE-601B
Piping and valves

Train 2: Pump G-14B
Heat Exchanger E-21B
Inlet Isolation MOV-814
Discharge Isolation MOV-834
Heat Exchanger Inlet MOV-822B

Power Cable: G-14B
MOV-814
MOV-834
MOV-822B
Control cable: MOV-814
MOV-834
MOV-822B
Piping and valves

Train 3: Piping and valves

High/Low Pressure Interface Equipment

Reactor Coolant System (RCS):

Train 1: Reactor Vessel Vent Valve: SV-2401
SV-2402
Pressurizer High Point Vent Valve: SV-2403
SV-2404

Control cable: SV-2401
SV-2402
SV-2403
SV-2404

High/Low Pressure Interface Equipment (contd)

Reactor Coolant System (RCS): (contd)

Train 2: Reactor Vessel Vent Valve: SV-3401
SV-3402
Pressurizer High Point Vent Valve: SV-3403
SV-3404
Control cable: SV-3401
SV-3402
SV-3403
SV-3404

Volume Control and Charging (VCC):

Train 1: Seal Water Return Isolation Valve CV-527
Control cable: CV-527

Spurious Operation Equipment

Reactor Coolant System (RCS):

Train 1: Reactor Coolant Pumps: G-2A
G-2C
Pressurizer Spray Valve: PCV-430C
PCV-430H
Control cable: G-2A
G-2C
PCV-430C
PCV-430H
Instrumentation cable: PCV-430C
PCV-430H
Train 2: Reactor Coolant Pump G-2B
Control cable: G-2B

Volume Control and Charging (VCC):

Train 1: Letdown Containment Isolation Valve CV-525
Control cable: CV-525
Train 2: Letdown Orfice Isolation Valves CV-202
CV-203
CV-204
Letdown Isolation Valve LCV-1112
Control cable: CV-202
CV-203
CV-204
LCV-1112

Spurious Operation Equipment (contd)

Safety Injection (SIS):

Train 1: Safety Injection Recirculation Valve MOV-356
Control cable: MOV-356
Train 2: Safety Injection Recirculation Valve MOV-357
Control cable: MOV-357
Train 3: Safety Injection Recirculation Valve MOV-358
Control cable: MOV-358

Containment Spray and Recirculation (CRS):

Train 1: Containment Spray Valve: CV-114
CV-82
CV-92
Power cable: CV-114
Control cable: CV-114
CV-82
Instrumentation cable: CV-114
CV-82

Alternate Shutdown Equipment

Reactor Coolant System (RCS):

Train 1: RCS Delta T: TE-400A
TE-2400C
TE-410A
TE-412C
TE-420A
TE-420C

Instrumentation Cable: TE-400A
TE-2400C
TE-410A
TE-412C
TE-420A
TE-420C

Alternate Shutdown Equipment (contd)

Component Cooling Water (CCW):

Train 1: RCP Thermal Barrier Pump G-964
Thermal Barrier Outlet Valve: CV-722A
CV-722B
CV-722C
Power cable: G-964
Control cable: CV-722A
CV-722B
CV-722C

Train 3: Piping and valves

Safety Injection (SIS):

Train 1: Safety Injection Discharge Valve MOV-850B
Power cable: MOV-850B
Control cable: MOV-850B

Train 2: Safety Injection Discharge Valve MOV-850A
Power cable: MOV-850A
Control cable: MOV-850A

Train 3: Safety Injection Discharge Valve MOV-850C
Power Cable: MOV-850C
Control cable: MOV-850C

Dedicated Shutdown Equipment

Reactor Coolant System (RCS):

Train J: Pressurizer Level LT-430A
Pressurizer Pressure PT-434A
Hot Leg Temperature: TE-402A
TE-412A
TE-422A
Cold Leg Temperature: TE-402B
TE-412B
TE-422B
Control cable: PORV Block Valve CV-530
PORV CV-546
Instrumentation cable: LT-430A
PT-434A
TE-402A
TE-412A
TE-422A
TE-402B
TE-412B
TE-422B

Dedicated Shutdown Equipment (contd)

Main Steam (MSS):

Train J: S/G Level: LT-450C
LT-451C
LT-452C
Instrumentation cable: LT-450C
LT-451C
LT-452C

Reactor Cycle Sampling System (RSS):

Train 1: PASS Reactor Coolant Loop C: Sample Valve CV-956
Control Cable: CV-956

Safety Related Equipment Not Required for Safe Shutdown

Main Steam (MSS):

Train 1: Instrumentation cable: FT-460
FT-461
FT-462

RCS Instrumentation (RCS):

Train 1: Control cable: CV-951
CV-953
CV-955
Train 2: Pressurizer Pressure PT-434
Fission Chamber Detector NE-1204
Instrumentation Cable NE-1204

Feedwater (FWS):

Train 3: Steam Generator Level Transmitters LT-453
LT-454
LT-455
Power cable: LT-453
LT-454
LT-455
Instrumentation cable: LT-453
LT-454
LT-455

Volume Control & Charging (VCC):

Train 2: PZR Auxiliary Spray Cont. Valve CV-305
Charging Loop A Cont. Valve CV-304
Control Cable: CV-305
CV-304

Safety Injection Recirculation Pumps
Cable: Trains 1 and 2

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figures 8-A and 8-B, sheet 3.

Technical Specification Barriers (contd)

Cable for the following systems is provided with a fire rated protective covering where it is routed within 20 feet of the redundant train:

Reactor Coolant System - Train J, Train 1
Main Steam System - Train J

Effects of Fire on Hot Standby Capability

RCS The reactor vessel, steam generators, pressurizer, and associated piping comprising the RCS pressure boundary will not be affected by a postulated design basis fire.

Damage to cabling for the power operated relief valves (PORVs) and their associated block valves may occur. Dedicated shutdown cables for operation of one PORV and block valve are 1 hour rated, the valve solenoids are also protected by a radiant energy shield. Dedicated shutdown operation of one PORV and block valve will therefore remain available. Operator action will be taken to deenergize normal power to PORVs and block valves.

Damage to source range flux monitors may occur. During operation of the dedicated shutdown system, shutdown margin will be determined by sampling primary system boron concentration.

Damage to cabling for pressurizer heater groups A, B, C, and D may occur. Dedicated shutdown cabling for pressurizer heater group is 1 hour rated and will therefore main available. Operator action will be taken to deenergize normal power to pressurizer heaters.

Damage to cabling for RCS instrumentation may occur. Dedicated shutdown instrumentation is 1 hour rated and will therefore remain available.

VCC Damage to equipment and cabling for charging system pressure instrumentation and charging control and seal water return control valves may occur. Operator action will be taken to deenergize power, to mitigate spurious operation, and to reposition charging system valves.

Damage to the seal supply filters is not expected, as there are no components in the area which could be adversely affected by a fire.

MSS Damage to steam generator level transmitters may occur. Dedicated shutdown instrumentation is 1 hour rated and will therefore remain available for shutdown.

CVS Damage to containment ventilation system fans, dampers, and associated cables may occur. Loss of the fans will disable operation of the neutron flux monitor. During operation of the dedicated shutdown system, shutdown margin will be determined by sampling primary system boron concentration.

Effects of Fire on Cold Shutdown Capability

RHR Damage to RHR equipment, cables, and instrumentation may occur. The dedicated auxiliary feedwater pump and its associated cables are located outside this fire area and will remain available for single phase cooldown.

Effects of Fire on High/Low Pressure Interface Equipment

RCS Damage to cabling for reactor vessel vent valves and pressurizer high point vent valves may occur. Operator action will be to deenergize power to the valves. The time required to deenergize the valves has been evaluated and determined to be acceptable.

VCC Damage to cabling for the seal water return isolation valves may occur. Operator action will be taken to deenergize power to the valves. The time required to deenergize the valves has been evaluated and determined to be acceptable.

Consequences of Spurious Operation

RCS Damage to cables for the reactor coolant pumps (RCPs) and the pressurizer spray valves may result in spurious operation of these components. Turbine trip will deenergize the pumps.

VCC Damage to cables for the letdown containment isolation valve may result in spurious operation. Operator action will be taken to deenergize this valve. Spurious operation of this valve until operator action is taken to deenergize power has been evaluated and determined to be acceptable.

Damage to cables for the letdown isolation valve and letdown orfice isolation valves may result in spurious operation of these valves. Charging path via the RWST will remain available.

SIS Damage to safety injection system recirculation valves may occur. The valves will fail as is in their normally closed position as required for safe shutdown .

CRS Damage to the cables for the containment spray valves may cause spurious operation of the valves. Operator action will be taken to close manual valves located upstream to isolate containment spray.

Effects of Fire on Alternate Shutdown Equipment

RCS Damage to cabling for RCS loops A, B, and C Delta T instrumentation may occur. This equipment is not credited for shutdown in this area.

CCW Loss of CCW flow due to damage to the RCP thermal barrier pumps may occur. Component cooling water is not required to support dedicated shutdown system operation. Interruption of seal cooling and seal injection to the reactor coolant pump seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

Effects of Fire on Alternate Shutdown Equipment (contd)

SIS Damage to cabling for safety injection system valves may occur. This equipment is not credited for shutdown in this area.

Effects of Fire on Dedicated Shutdown Equipment

RCS Cabling for dedicated shutdown RCS instrumentation are 1-hour rated. A radiant energy shield separates the normal instrumentation from the dedicated shutdown instrumentation.

Cables for dedicated shutdown operation for one of the power operated relief valves (PORVs) and one of the PORV block valves are 1-hour rated. A radiant energy shield is provided for the solenoids associated with the redundant PORVs and PORV block valves.

MSS Cables for dedicated shutdown MSS instrumentation is provided with 1 hour rated cables. The dedicated shutdown instruments are located within the steam generator reinforced concrete enclosure assuring that one loop of instruments remains available.

See Appendix A for a detailed description of the dedicated shutdown system.

Conclusions

The fire detection and suppression systems in containment provide local coverage of the fire hazards in this fire area. These systems are expected to provide adequate, early warning in the ESO office and control room. In addition, the reactor coolant pumps are provided with a lube oil collection system designed to collect oil and prevent it from coming into contact with high temperature components and ignition sources. The lube oil collection system meets the requirements of 10CFR50 Apppendix R Section III.O. Also, the charcoal combustible loading for this area is entirely contained within the charcoal filter units of the containment ventilation system. The fire protection features are expected to adequately mitigate the consequences of the fire and confine it to the area under consideration.

The dedicated safe shutdown system is credited for this area. This system is designed to achieve cold shutdown due to the potential loss of normal shutdown systems. The NRC has reviewed and approved use of the dedicated safe shutdown equipment for this area. An exemption to the requirements of 10CFR50 Appendix R, Section III.G.3 has been granted as the dedicated equipment is not independent of the area under consideration and partial area detection and suppression are provided.

UNIT 1 REACTOR AUXILIARY BUILDING

The Unit 1 Reactor Auxiliary Building consists of separate reinforced concrete block structures that contain the charging pumps, the boric acid system, radwaste pumps, tanks, and equipment. The reactor auxiliary building analysis also includes the pipe tunnels. The Reactor Auxiliary Building is divided into four (4) fire areas.

The Reactor Auxiliary Building contains components and/or cabling for the following systems, which can be used to achieve, maintain, or support safe shutdown:

- Reactor Coolant
- Volume Control and Charging
- Main Steam
- Component Cooling Water
- Essential Electric Systems

The types of fire suppression/detection equipment in or near the building consist of the following:

- Wet pipe sprinkler system in charging pump room.
- Portable extinguishers.
- Manual hose stations.
- Ionization smoke detectors.

Fire Area/Zone	Contains Safe Shutdown Equipment	Contains Safety Related Equipment Not Required for Safe Shutdown	Page No.	Figure No.
1-AB-(-3)-2A	Yes	Yes	1/AB-1	8-C
1-AB-20-2C	No	No	1/AB-8	8-C
1-AB-20-2D	No	No	1/AB-9	8-C
1-AB-20-2F	No	No	1/AB-10	8-C
1-AB-20-2G	No	No	1/AB-11	8-C
1-AB-20-2H	No	No	1/AB-12	8-C
1-AB-20-2I	No	No	1/AB-13	8-C
1-AB-20-2L	No	No	1/AB-14	8-C
1-AB-20-2N	Yes	No	1/AB-15	8-C
1-AB-30-2P	No	No	1/AB-19	8-C
1-AB-20-3	Yes	No	1/AB-20	8-C
1-AB-11-34	Yes	Yes	1/AB-24	8-A, 8-C
1-AB-14-35	Yes	No	1/AB-30	8-C

FIRE AREA/ZONE: 1-AB-(-3)-2A

AREA: 6818 sq.ft. **DESCRIPTION:** REACTOR AUXILIARY BLDG-LOWER LEVEL

COMBUSTIBLES

Oil & Grease	172 lbs.
Cable (30% Fill)	1746 lbs.
Class A	350 lbs.
Charcoal	0 lbs.
Plastics	10 lbs.
Miscellaneous	180 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	4687 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	E/875
Fire Duration	0.06 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	Ket pipe sprinkler - charging pump rm.
Hose Stations	(2),(1) in 4D, hydrants on fire main
Portable Extinguishers	(3)10A:60B:C,(1)40B:C,(1)10:BC,(1)4A:40BC*
Detectors (Type)	ionization (local)

FIRE RESISTANCE RATING

- Walls	3hr/34, abv. grd. on north,HC/below #
- Floors,Ceiling or Roof	HC
- Fixed Openings	CH/2C,2G,4D, MH/4D, OP/4D
- Penetrations	P,C, ND/2C,4D, NP/2P
- Doors(UL Class/Zone #)	NR/4D, A/2C

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging	1,2,J	1,2	1,2,J
Main Steam			
Auxiliary Feedwater			
Component Cooling Water		3	
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

	EQUIPMENT	PIPING VALVES	CABLE
SUMMARY	1,2,J	1,2,3	1,2,J

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)		2,J	2
120 V (AC)		J	
125 V (DC)			
SUMMARY		2,J	2

SHUTDOWN SYSTEM CREDITED :Alternate: SIS

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :yes(SEE TEXT)
Spurious Operation :yes(SEE TEXT)

NOTES

* IN 2C & 4D,(1)10B:C IN 2C
# GRADE, CB/OTHERS

Location

Reactor Auxiliary Building - El. (-2'-3") - Reactor Auxiliary Building Lower Level - 6818 square feet - Fig. 8-C.

Combustible Material	Quantity
Oil	172 lbs
Cable insulation	1,746 lbs
Class A combustibles	350 lbs
Miscellaneous combustibles	180 lbs
Plastics	10 lbs

Fire loading - 4687 Btu/sq ft
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - E/875°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Note 3: Seal welded hydrogen piping routed within the zone.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 875°F and would involve oil, plastics, cable insulation, Class A, and miscellaneous combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

Ionization smoke detectors, located in hazard areas within the zone, provide early warning alarm in the ESO office and control room. An automatic wet pipe sprinkler system protects the charging pump room. Manual fire fighting equipment is available within the zone and in adjacent zones 1-AB-20-2C and 1-YD-14-4D. In addition, hose streams are available from yard hydrants.

Construction

Above grade, the north wall of the boric acid injection pump room is 3 hour rated, the east wall is non-rated reinforced concrete with an approximate

Construction (contd)

thickness of 32 inches. The remaining walls above grade are concrete block with an approximate thickness of 8 inches, with the exception of the gas stripper cubicle walls which are reinforced concrete with an approximate thickness of 24 inches. A non-rated door provides access to the zone from the yard area, (1-YD-14-4D) and a 3 hour rated door opens to the solid waste baling room (1-AB-20-2C). Below grade the east wall of the zone adjoining the pipe tunnel (1-AB-11-34) is 3 hour rated. The remaining walls of the zone are composed of non-rated concrete with a minimum thickness of 18 inches. The ceiling is precast concrete slab with a minimum thickness of 6 inches. Ventilation duct penetrations are not provided with fire dampers.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

480V (AC): Train 2: Motor Control Center 2A
Power cable: MCC-2A

Volume Control and Charging (VCC):

Train 1: Charging Pump G-8B
Lube Oil Cooler E-907 (Water Cooled)
Lube Oil Pump G-943
Lube Oil Cooler E-909 (Air Cooled)
Lube Oil Pump G-988 (Shaft Driven)
RWST Charging Isolation Valve MOV-1100B
Lube Oil Cooling Fan MG-8BF
Power cable: G-8B
G-943
MOV-1100B
MG-8BF
Control cable: G-943
MOV-1100B
MG-8BF
MOV-1100E
Piping and valves

Train 2: Charging Pump G-8A
Lube Oil Cooler E-906 (Water Cooled)
Lube Oil Cooling Fan MG-8AF
Lube Oil Pump G-942
Lube Oil Cooler E-908 (Air Cooled)
Lube Oil Pump G-987 (Shaft Driven)
RWST Charging Isolation Valve MOV-1100D
Power cable: G-8A
G-942
MG-8AF
MOV-1100D
Control cable: G-942
MG-8AF
MOV-1100C
Piping and valves

Equipment Required for Hot Standby (contd)

RWST Charging Isolation Valve MOV-1100D
Power cable: MOV-1100D
Control cable: MOV-1100D
Piping and valves

Train J: Charging Pump RWST Suction Bypass valve: FCV-5051
Power Cable: FCV-5051
Control Cable: FCV-5051

Component Cooling Water (CCW):

Train 3: Piping and Valves

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

Volume Control and Charging (VCC):

Train 2: Power cable: Seal Water Return Isolation Valve CV-528

Spurious Operation Equipment

Volume Control and Charging (VCC):

Train 1: Instrument Cable: VCT LEVEL LT 2550

Train 2: Charging System Test Pump G-42
Boric Acid Supply Control Valve CV-334
Chemical Blending Control Valve CV-406A
Chemical Blending Control Valve CV-406B
Primary Water Makeup Control Valve FCV-1102A
Boric Acid Pump Discharge Control Valve FCV-1102B
Power Cable: Letdown Containment Isolation Valve CV-526
Control Cable: G-42
CV-334
FCV-1102A
FCV-1102B
Chemical Blending Control Valve CV-406A
Chemical Blending Control Valve CV-406B
Demineralizer Bypass Valve TCV-1105
Letdown Flow to Radwaste Valve LCV-1100A

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

Essential Electrical System (EES):

480V(AC): Train J: Power Cable: DSD Motor Control Center B30

120V(AC): Train J: Power cable: Dedicated Shutdown Panel C-38
Distribution Panel Y-47

Volume Control and Charging (VCC):

Train J: Power Cable: Charging Pump G-8A
Lube Oil Cooling Fan MG-8AF

Safety Related Equipment Not Required for Safe Shutdown

Boric Acid Transfer Pump: G-9A
G-9B
Boric Acid Injection Pump: G-12
Cable: Train 1 & 2

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-C, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for Motor Control Center 2A may occur. The equipment powered from this motor control center is required to support charging system operation. The safety injection system will be used as an alternate to the charging system for a fire in this fire zone. Safety injection system equipment and its associated cabling are located outside this fire zone and will remain available.

VCC Damage to charging pumps, lube oil pumps, lube oil cooling fans, and lube oil coolers and volume control tank level signal may occur. Safety injection system equipment and its associated cabling are located outside this fire zone and will remain available. Operator action will be taken to deenergize the charging pumps.

Damage to RWST charging isolation valves and charging pump RWST suction bypass valve may occur. Operator action will be taken to ensure closure of these valves.

Damage to cabling for the volume control tank isolation valve may cause this valve to spuriously operate. Spurious actuation of this valve will have no effect on safety injection system operation.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

VCC Damage to cabling for the train 2 seal water return isolation valve may occur. The train 1 valve and its associated cabling are located outside this fire zone and will remain available.

Consequences of Spurious Operation

VCC Damage to cabling for the charging system test pump may cause spurious operation of the pump. Operator action will be taken to deenergize the pump.

Damage to cabling for G-8B Low VCT Level Trip could trip the pump. The Safety Injection System will be used as an alternate shutdown system to the charging system

Damage to cabling for the boric acid supply control valve could cause spurious operation of this valve. Operator action will be taken to close manual valve located upstream. Spurious operation of this valve will have no effect on safety injection system operation.

Damage to cabling for the chemical blending, primary water makeup and boric acid pump discharge control valves may cause spurious operation of these valves. Operator action will be taken to close manual valve located downstream of the primary water makeup control valve. Spurious operation of these valves until operator action is taken to isolate close the manual valve has been analyzed and determined to be acceptable. Spurious operation of the valves will have no effect on safety injection system operation.

Damage to cabling for the demineralizer bypass and letdown flow to radwaste valves may cause these valves to spuriously operate. Spurious operation of these valves will have no effect on safe shutdown.

Damage to cabling for the train 2 letdown containment isolation valve may cause this valve to spuriously operate. The train 1 valve and its associated cabling are located outside this fire zone and will remain available.

Effects of Fire on Alternate Shutdown Capability

None

Effects of Fire on Dedicated Shutdown Capability

EES Damage to cabling for motor control center B30A may occur. The safety injection system will remain available.

Damage to cabling for dedicated shutdown panel C-38 and distribution panel Y-47 may occur. Dedicated safe shutdown is not utilized for a fire in this fire zone.

Effects of Fire on Dedicated Shutdown Capability (contd)

VCC Damage to cabling for the train 2 charging pump and its associated cooling fan may occur. Dedicated safe shutdown is not utilized for a fire in this fire zone.

Conclusions

The wet pipe sprinkler system in the charging pump room, portable fire extinguishers, and hose stations provide fire suppression capabilities for the lower level of the reactor auxiliary building. The ionization smoke detectors installed locally in the charging pump room, at motor control center 2A, at the radwaste control board, outside the radwaste tank rooms, and in the boric acid injection pump room provide early alarm in the ESO office and control room. These fire protection features will adequately mitigate the consequences of the fire and confine it to the zone under consideration.

The normal safe shutdown equipment and instrumentation credited for this zone has been demonstrated to remain available for safe shutdown due to the spatial separation and fire protection features provided in accordance with 10CFR50 Appendix R, Section III.G.1. The safety injection system will also be used as an alternate shutdown system for a fire in this zone. An exemption from the requirements of 10CFR50 Appendix R, Section III.G.3 has been granted for partial detection and suppression.

FIRE AREA/ZONE: 1-AB-20-2C

AREA: 415 sq.ft. **DESCRIPTION:** SOLID WASTE BALING ROOM

COMBUSTIBLES

Oil & Grease	363 lbs.
Cable (30% Fill)	0 lbs.
Class A	1990 lbs.
Charcoal	0 lbs.
Plastics	5400 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	210585 BTU's/sq.ft.
Fire Loading - Max Permissible	240000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1900
Fire Duration	2.63 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none,(1) in 2A,(1) in 4D, hydrants on #
Portable Extinguishers	(1)4A:40B:C,(1)10:BC,(1)10A:60:BC in 2A
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr/south, CB/ others
- Floors,Ceiling or Roof	HC/floor, NR/roof
- Fixed Openings	CH/2A
- Penetrations	P, NP/2G, NC/2G,4D,2H, ND/2A,4D
- Doors(UL Class/Zone #)	(2)NR/4D, A/2A

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

COLD# SHUTDOWN SYSTEMS

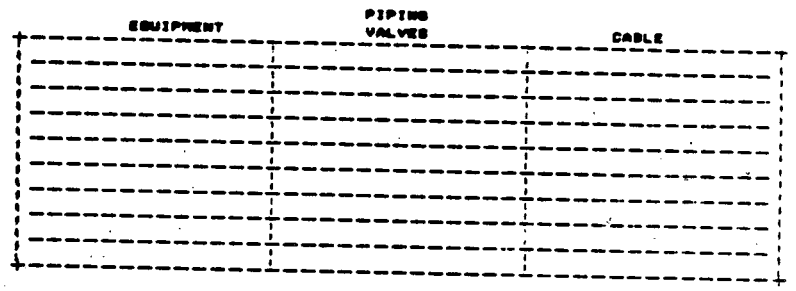
Residual Heat Removal
Component Cooling Wtr (to RHR)

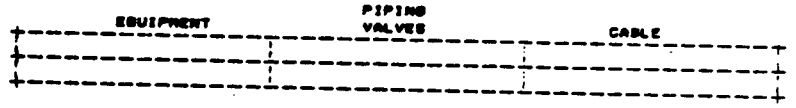
ALTERNATE SHUTDOWN SYSTEMS

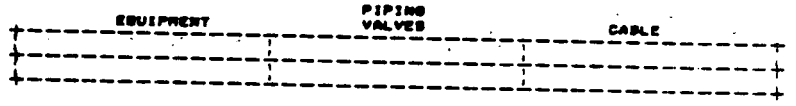
Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

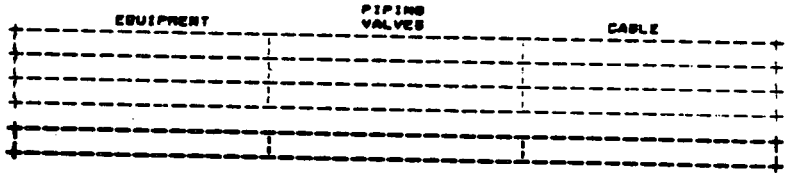
DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)





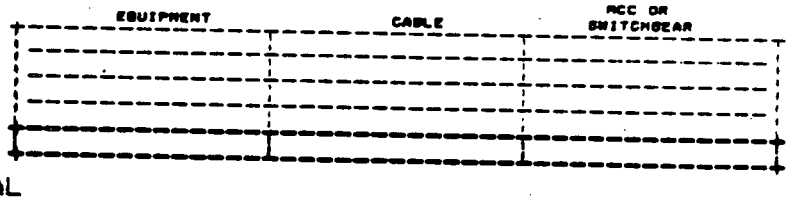




SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)



SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

NOTES

#fire main

FIRE AREA/ZONE: 1-AB-20-2D

AREA: 379 sq.ft. **DESCRIPTION:** WASTE GAS CRYOGENIC TREAT. BLDG.

COMBUSTIBLES

Oil & Grease	2 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	8 lbs.
Miscellaneous	5 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	591 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	B/150
Fire Duration	0.01 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 4D, hydrants on fire main
Portable Extinguishers	none,(2)10A:60B:C, (1)160B:C in 4D
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	LV/4D
- Penetrations	P, ND/4D
- Doors(UL Class/Zone #)	NR/4D

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE: 1-AB-20-2F

AREA: 232 sq.ft. **DESCRIPTION:** HIGH LEVEL SOLID WASTE STORAGE

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs. all storage in cvrd mtl drums
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	0 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	N/A
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 2A
Portable Extinguishers	none, (1)4A:40B:C in 4D
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	OD/4D
- Penetrations	none
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE: 1-AB-20-2G

AREA: 189 sq.ft. **DESCRIPTION:** RESIN SLURRY TANK ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	60 lbs.
Charcoal	0 lbs.
Plastics	10 lbs.
Miscellaneous	7821 lbs. see note
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	8714 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	M/500
Fire Duration	0.11 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none
Portable Extinguishers	none, (2)10A:60B:C in 4D
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC/south, CB/others
- Floors,Ceiling or Roof	HC/floor, NR/roof
- Fixed Openings	CH/2A
- Penetrations	C,P, NC/2C, NP/2C,2L
- Doors(UL Class/Zone #)	A/4D

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

NOTES

dry resin located in this area

FIRE AREA/ZONE: 1-AB-20-2H

AREA: 442 sq.ft. **DESCRIPTION:** PROTECTIVE CLOTHING STORAGE

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	4255 lbs.
Charcoal	0 lbs.
Plastics	620 lbs.
Miscellaneous	2700 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	220190 BTU's/sq.ft.
Fire Loading - Max Permissible	240000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1900
Fire Duration	2.75 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none
Portable Extinguishers	none, (2)10A:60B:C in 4D
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	CB
- Floors,Ceiling or Roof	HC/floor, NR/roof
- Fixed Openings	OP/4D
- Penetrations	C, NC/2C
- Doors(UL Class/Zone #)	(2)NR/4D

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

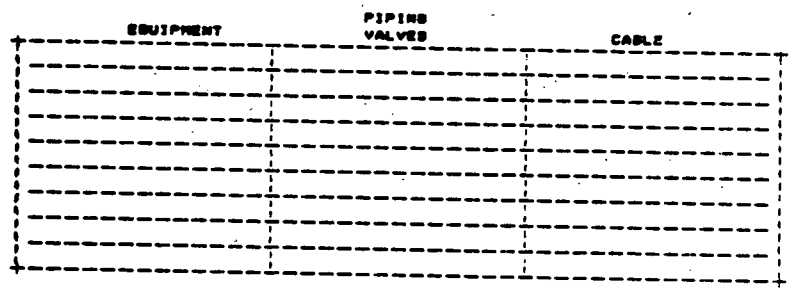
ALTERNATE SHUTDOWN SYSTEMS

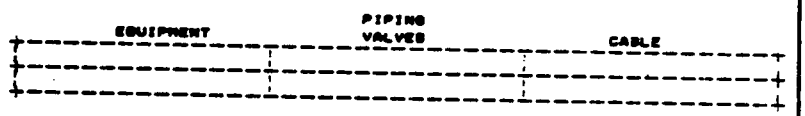
Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

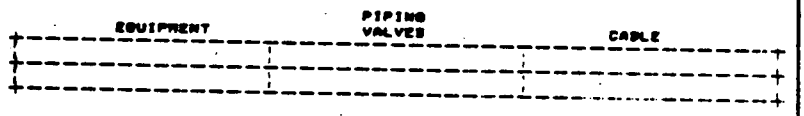
DEDICATED SHUTDOWN SYSTEMS

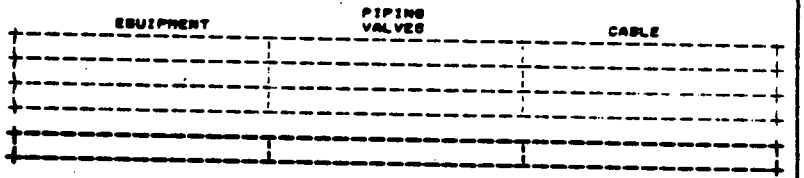
Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

SUMMARY





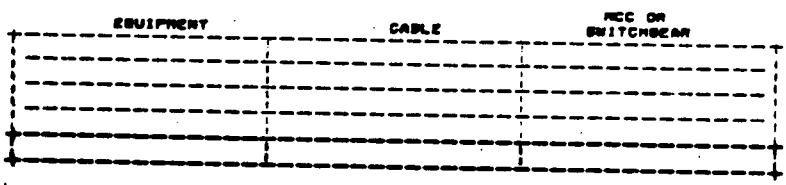




ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

SUMMARY



SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE: 1-AB-20-2I

AREA: 92 sq.ft. **DESCRIPTION:** BORON CONCENTRATION MEASURING ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	2 lbs.
Miscellaneous	2 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	683 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	B/150
Fire Duration	0.01 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 4D
Portable Extinguishers	none, (1)160B:C in 4D
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	OD/4D
- Penetrations	C, NP/2N, NC/2N
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE: 1-AB-20-2L

AREA: 590 sq.ft. **DESCRIPTION:** DECONTAMINATION ROOM

COMBUSTIBLES

Oil & Grease	6 lbs.
Cable (30% Fill)	0 lbs.
Class A	1956 lbs.
Charcoal	0 lbs.
Plastics	1410 lbs.
Miscellaneous	296 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	83292 BTU's/sq.ft.
Fire Loading - Max Permissible	240000 BTU's/sq.ft.
Heat Rate (degrees F)	D/1750
Fire Duration	1.04 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 4B
Portable Extinguishers	(1)10A:60B:C, (2)10A:60B:C in 4D
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	HC/3, CB/others
- Floors,Ceiling or Roof	HC/floor, NR/roof
- Fixed Openings	OP/4D, LV/4D
- Penetrations	C, NP/2G, NC/4D
- Doors(UL Class/Zone #)	(2)NR/4D

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

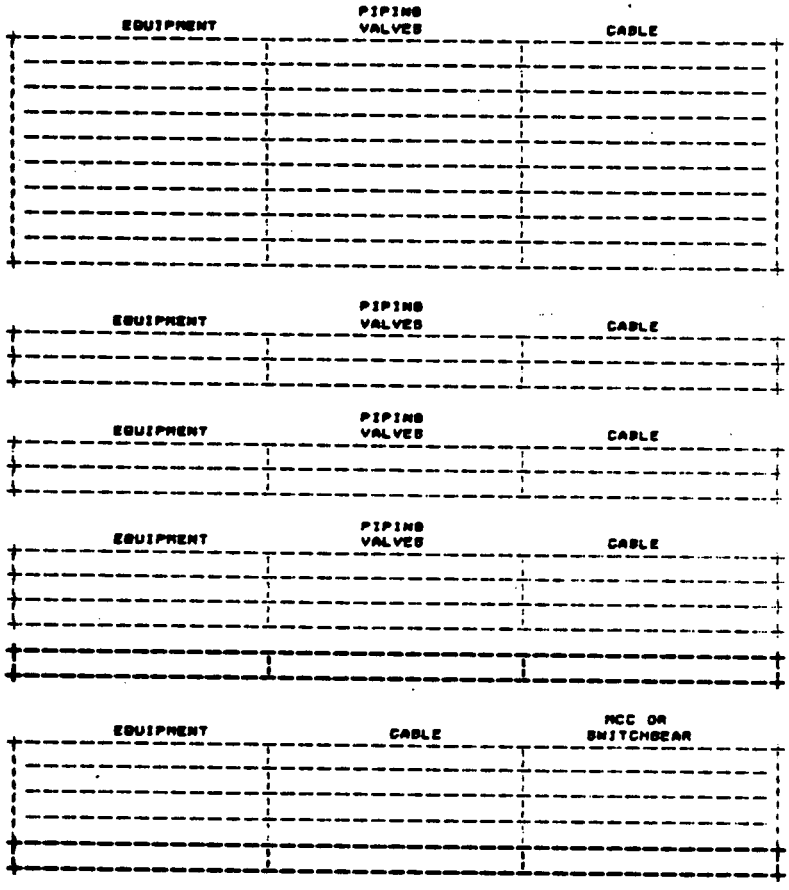
ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

SUMMARY



ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE: 1-AB-20-2N

AREA: 111 sq.ft. **DESCRIPTION:** REACTOR COOLANT FILTER ENCLOSURE

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	50 lbs.
Charcoal	0 lbs.
Plastics	2 lbs.
Miscellaneous	20 lbs.
Miscellaneous Gases	1 lbs.

DESIGN BASIS FIRE

Fire Loading	8315 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1050
Fire Duration	0.10 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 2A, (1) in 4D
Portable Extinguishers	none, (1)160B:C, (2)10A:60BC in 4D
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	OD/4D, MH/4D
- Penetrations	P, NP/2I, NC/2I
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging		2	1,2
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

		2	1,2

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			
SUMMARY			

SHUTDOWN SYSTEM CREDITED :Alternate:SIS

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :yes(SEE TEXT)

FIRE AREA/ZONE 1-AB-20-2N

Location

Reactor Auxiliary Building - El. 20'-0" - Reactor Coolant Filter Enclosure - 111 square feet - Fig. 8-C.

Combustible Material	Quantity
Class A combustibles	50 lbs
Miscellaneous combustibles	20 lbs
Hydrogen	191 C.F.
Plastic	2 lbs

Fire loading - 8,315 Btu/sq ft
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - E/1050 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: Seal welded hydrogen piping is routed within the zone.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1050 °F and would involve Class A and miscellaneous combustibles, hydrogen, and plastic.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

Automatic fire suppression or detection systems are not provided within the zone. Manual fire fighting equipment is available within the zone and in adjacent zone 1-YD-14-4D.

Construction

The north and east walls of the zone are non-rated reinforced concrete construction with a minimum thickness of 21 inches. The south and west walls are non-rated reinforced concrete with an approximate thickness of 12 inches. The roof of the zone is concrete with an approximate thickness of 20 inches. A gate in the west wall between this zone and 1-YD-14-4D provides access to the zone. There are no ventilation duct penetrations.

Equipment Required for Hot Standby

Volume Control and Charging (VCC):

Train 1:	Control cable:	RWST Charging Isolation Valve MOV-1100B MOV-1100C MOV-1100E
	Power Cable:	MOV-1100E

Equipment Required for Hot Standby (contd)

Volume Control and Charging (VCC):

Train 2: Control cable: Volume Control Tank Isolation Valve MOV-1100C
Pump G-8A
RWST Charging Isolation Valve MOV-1100D

Piping and valves

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

Volume Control and Charging (VCC):

Train 1: VCT Level Trans. LT 2550
Instrument Cable
VCT Level LT 2550

Train 2: Demineralizer Bypass Valve TCV-1105
Letdown Flow to Radwaste Valve LCV-1100A
Control cable: TCV-1105
LCV-1100A

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-C, Sheet 3.

Effects of Fire on Hot Standby Capability

VCC Damage to cabling for the train 2 charging pump and VCT level transmitter may cause spurious operation or trip of the pump. The train 1 charging pump will remain available, via trip override in the control room.

Effects of Fire on Hot Standby Capability (contd)

Damage to cabling for the VCT isolation and RWST charging isolation valves may cause spurious operation. If the VCT isolation and RWST charging isolation valves fails close the RWST charging isolation bypass valve will remain available. If the VCT isolation valve fails open letdown flow will remain available to protect the charging pump.

Additionally, safety injection will remain available for alternate shutdown should damage to the charging system occur.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

VCC Damage to cabling for the demineralizer bypass and letdown flow to radwaste valves may cause spurious operation. Charging path via the RWST will remain available.

Damage to cabling for G8B low VCT Level Trip could trip the pump. G8A will remain available via the trip override in the control room.

Additionally, safety injection will remain available for alternate shutdown should damage to the charging system occur.

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

The manual fire-fighting equipment in the adjacent yard area provides fire suppression capability for a fire in the reactor coolant filter enclosure. The duration of the postulated design basis fire is relatively short. The open gate in the zone allows heat and products of combustion to dissipate into the open atmosphere. The fire protection features are expected to adequately mitigate the consequences of the fire and confine it to the zone under consideration.

Safety injection system components can be used for RCS inventory and reactivity control. The normal safe shutdown equipment and instrumentation

credited for a fire in this zone has been demonstrated to remain available for safe shutdown due to the fire barriers and spatial separation in accordance with 10CFR50 Appendix R, Section III.G.1. Alternate shutdown is credited for a fire in this zone. An exemption to the requirements of 10CFR50 Appendix R, Section III.G.3 has been granted for lack of detection and fixed suppression.

FIRE AREA/ZONE: 1-AB-30-2P

AREA: 302 sq.ft. **DESCRIPTION:** BORIC ACID MIXING ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	660 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	17464 BTU's/sq.ft.
Fire Loading - Max Permissible	20000 BTU's/sq.ft.
Heat Rate (degrees F)	B/600
Fire Duration	0.22 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none,(1) in 4D,(1) in 2A,hydrants on **
Portable Extinguishers	(1)10B:C
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	CB
- Floors,Ceiling or Roof	HC/foor, NR/roof
- Fixed Openings	OP/4D
- Penetrations	P,C, ND/4D, NC/4D, NP/2A
- Doors(UL Class/Zone #)	(2)NR/4D

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

NOTES

** - fire main

FIRE AREA/ZONE: 1-AB-20-3

AREA: 180 sq.ft. **DESCRIPTION:** VOLUME CONTROL TANK ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	0 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	N/A
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none
Portable Extinguishers	none
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	CH/4D
- Penetrations	F,C
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging	3	3	2
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

3	3	2

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no

Spurious Operation :yes(SEE TEXT)

NOTES

(SEE TEXT)

FIRE AREA/ZONE 1-AB-20-3

Location

Reactor Auxiliary Building - El. 20'-0" - Volume Control Tank Room - 180 square feet - Fig. 8-C.

Combustible Material	Quantity
None	Nil

Fire loading - None
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - None

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: Seal welded hydrogen piping is routed within the zone.

Design Basis Fire

A fire is not expected to occur in this area during normal operations. The maximum credible fire is postulated to involve transient combustible materials.

Fire Protection Equipment

Automatic fire suppression, detection, or manual fire-fighting equipment is not provided within the area.

Construction

The area is bounded by non-rated heavy concrete walls with a minimum thickness of 32 inches. The roof of the area is non-rated reinforced concrete construction with an approximate thickness of 20 inches. The floor is reinforced concrete with an approximate thickness of 41 inches. The area is accessed through a concrete hatch in the roof.

Equipment Required for Hot Standby

Volume Control and Charging (VCC):

Train 3: Volume Control Tank C-15
Piping

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

Volume Control and Charging (VCC):
Train 2: Control cable: Demineralizer Bypass Valve TCV-1105
Letdown Flow to Radwaste Valve LCV-1100A

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-C, Sheet 3.

Effects of Fire on Hot Standby Capability

VCC The loss of the volume control tank and chemical and volume control system piping is not expected.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

VCC Damage to cabling for the demineralizer bypass and letdown flow to radwaste valves may cause spurious operation of these valves. The charging path via the RWST will remain available.

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

The volume control tank room is totally enclosed by nonrated heavy concrete and accessed through a concrete hatch in the roof. There are no in-situ combustibles in the area and transient combustibles would be minimal due to the remote location and access to the zone. These features will adequately mitigate the consequences of the fire and confine it to the area under consideration.

Normal shutdown is credited for a fire in this area. The safe shutdown equipment credited for a fire in this area is expected to remain available due to fire barriers and spatial seperation in accordance with 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-AB-11-34

AREA: 1321 sq.ft. **DESCRIPTION:** PIPE TUNNEL

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	1229 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	11909 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	C/800
Fire Duration	0.15 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (2) in 4D
Portable Extinguishers	(2)4A:40B:C, (1)10B:C in 4D
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr
- Floors,Ceiling or Roof	HC
- Fixed Openings	OH/4D,CH/4D,M/4D
- Penetrations	P,C,NP/4D,NC/4D
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			1,2
Main Steam	3		
Auxiliary Feedwater			
Component Cooling Water			1
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			1
Component Cooling Wtr (to RHR)	3		1

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

	3,2		1,2

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)		2	
120 V (AC)			
125 V (DC)			
SUMMARY		2	

SHUTDOWN SYSTEM CREDITED :Alternate: Charging

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :yes(SEE TEXT)

Location

Reactor Auxiliary Building - El. 11'-0" - Pipe Tunnel - 1321 square feet - Fig. 8-A, 8-C.

Combustible Material	Quantity
Cable insulation	1229 lbs

Fire loading - 11909 Btu's/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - C/800°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Note 3: Seal welded hydrogen piping is routed within the area.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 800 °F and would involve cable insulation.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

Ionization smoke detectors, located within the area, provide early warning alarm in the ESO office and the control room. Manual fire fighting equipment is available within the area and in adjacent zone 1-YD-14-4D.

Construction

The area is below grade. The walls separating the area from adjacent fire areas/zones are 3 hour rated. The ceiling is non-rated reinforced concrete with an approximate thickness of 9 inches. An open hatch at the east end of the east-west tunnel communicates with the yard area (1-YD-14-4D). The area is accessed through a concrete hatch and a manhole at grade. There are no ventilation duct penetrations.

Equipment Required for Hot Standby

Essential Electrical Systems (EES):

480V (AC): Train 2: Power cable: MCC-2A

Volume Control and Charging (VCC):

Train 1: Control cable: RWST Charging Isolation Valve MOV-1100B
Charging Flow Control Valve FCV-1112
Lube Oil Pump G-943
Instrumentation cable: Charging Flow FT-1112
Train 2: Power cable: Pump G-8A
RWST Charging Isolation Valve MOV-1100D
Control cable: Lube Oil Pump G-942
Lube Oil Cooling Fan MG-8AF
Seal Injection Flow Control Valve FCV-1115A
FCV-1115B
FCV-1115C
Volume Control Tank Isolation Valve MOV-1100C
MOV-1000D

Component Cooling Water (CCW)
Train 1: Power Cable: Component Cooling Water Pump G15A

Main Steam (MSS):

Train 3: Piping

Equipment Required for Cold Shutdown

Component Cooling Water (CCW):

Train 1: Control cable: CCW Flow Control for RHR Heat Exchanger TCV-601A
CCW Flow Control for RHR Heat Exchanger TCV-601B
Instrumentation Cable: TCV-601A
TCV-601B
Train 3: Piping

Residual Heat Removal (RHR):
Train 1: Power Cable: RHR HX E-21A Inlet Valve MOV-822A

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

Volume Control and Charging (VCC):

Train 1: Instrument cable: VCT Level LT 2550

Train 2: Control cable: Test Pump G-42
Primary Water Makeup Control Valve FCV-1102A
Boric Acid Pump Discharge Control Valve FCV-1102B
Boric Acid Supply Control Valve CV-334
Chemical Blending Control Valve CV-406A
Chemical Blending Control Valve CV-406B
RCS Excess Letdown to RHR Isolation Valve CV-414
Letdown Flow to Radwaste Valve LCV-1100A
Demineralizer Bypass Valve TCV-1105
Low Pressure Letdown Valve PCV-1105

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-A and 8-C, Sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for the train 2 motor control center 2A may occur. Power from the train 1 MCC will remain available to operate the train 1 charging pump.

VCC Damage to cabling for normal operation of the train 2 charging pump and its associated support equipment may occur. Cabling for dedicated shutdown system operation of the train 2 charging pump and its associated support equipment is located outside this fire area and will remain available.

Effects of Fire on Hot Standby Capability (contd)

Damage to cabling for the volume control tank and RWST charging isolation valves may cause spurious operation of the valves. If the VCT and charging RWST isolation valves fail closed, an automatic bypass around the RWST charging isolation valves will preclude loss of charging pump suction flow path. If the VCT isolation valve spuriously remains open, with a loss of letdown, a low level signal from the volume control tank will trip the train 2 charging pump. Operator action will be taken to manually close the volume control tank isolation valve and verify that one of the RWST charging isolation valves and the RWST isolation valve are open.

Damage to cabling for charging flow control valve and flow transmitter may occur. Operator action will be taken to close manual valves located upstream to permit charging through the seal injection flowpath. For higher makeup flow rates through charging loop A, operator action will be required to manually override and open the charging flow control valve.

Damage to cabling for seal injection flow control valves may occur. Operator action will be taken to fail the valves open; verify seal water supply valves closed; and control seal injection flow using manual valves located upstream of the charging flow control valve.

CCW Damage to cabling for the Train 1 CCW Pump may occur. The redundant Train 2 pump will remain available.

Effects of Fire on Cold Shutdown Capability

CCW Damage to cabling for CCW temperature control valves may occur. The valves will fail to their required safe shutdown position. If required, flow control may also be achieved using a manual valve located downstream.

RHR Damage to the Train 1 RHR HX Inlet Valve Power Cable may occur. The Train 1 or 2 valve is in the open position with its power locked out during normal operation.

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

VCC Damage to cabling for the charging system test pump could cause spurious operation of the pump. Operator action will be taken to deenergize the pump.

Damage to cabling for G8B low VCT level trip could trip the pump. Dedicated shutdown system power to G81A can be utilized.

Damage to cabling for the primary water makeup control valve could cause the valve to spuriously open, allowing primary plant makeup water to be supplied directly to the charging pump suction. Spurious actuation of the valve until operator action is taken to close the downstream manual valve has been evaluated and determined to be acceptable.

Damage to cabling for the boric acid supply control valve may cause spurious operation of this valve. Operator action will be taken to close manual valve located upstream.

Consequences of Spurious Operation (contd)

Damage to cabling for the chemical blending, primary water makeup and boric acid pump discharge control valves may cause spurious operation of these valves. Operator action will be taken to close manual valve located downstream of the primary water makeup control valve.

Damage to cabling for the RCS excess letdown to RHR isolation, letdown to radwaste, demineralizer bypass, and low pressure letdown valves may cause spurious operation of these valves. Charging path via the RWST will remain available.

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

The ionization detection system is expected to detect the products of combustion from an incipient fire and alarm in the ESO office and the control room. Manual fire-fighting equipment in the adjacent yard area provides fire suppression capability for this area. The duration of the postulated fire is relatively short. The pipe tunnel area is constructed of 3-hour rated walls. The northeast end of the pipe tunnel is open to the yard area. The configuration of the fire area, available paths for dissipation of products of combustion in addition to the detection and suppression capability, adequately mitigate the consequences of the fire and confine it to the area under consideration.

The normal safe shutdown equipment and instrumentation credited for a fire in this area has been demonstrated to remain available for safe shutdown due to fire barriers and spatial seperation in accordance with 10CFR50 Appendix R, Section III.G.1. Dedicated operation of the the train 2 charging pump is credited as alternate shutdown in this area should a fire result in loss of the train 1 and normal power to the train 2 charging pumps. The cables associated with dedicated operation of the train 2 charging pump are independent of the area under consideration in accordance the 10CFR50 Appendix R, Section III.G.3. An exemption from the requirements of 10CFR50 Appendix R, Section III.G.3 has been granted for the lack of area wide suppression in this area.

FIRE AREA/ZONE: 1-AB-14-35

AREA: 125 sq.ft. **DESCRIPTION:** NORTH PIPE TUNNEL

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	0 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	N/A
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 4D
Portable Extinguishers	none
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	3hr/34,HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	CH/4D
- Penetrations	P
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging		3	1,2
Main Steam			
Auxiliary Feedwater			
Component Cooling Water		3	
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

		3	1,2

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			
SUMMARY			

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE 1-AB-14-35

Location

Reactor Auxiliary Building - El. 14'-0" - North Pipe Tunnel - 125 square feet - Fig. 8-C.

Combustible Material	Quantity
None	Nil

Fire loading - 0
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - None

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

A fire is not expected to occur in or be transmitted to this fire area.

Fire Protection Equipment

Automatic fire suppression, detection, or manual fire fighting equipment is not provided within the area. Manual fire fighting equipment is available in adjacent zone 1-YD-14-4D.

Construction

The area is below grade. The wall separating this area from area 1-AB-11-34 is 3 hour rated reinforced concrete. The remaining walls and floor are reinforced concrete with an approximate thickness of 12 inches. The roof of the area is 9 inch thick reinforced heavy concrete. A concrete hatch provides access to the area from the yard area (1-YD-14-4D). There are no ventilation duct penetrations in this area.

Equipment Required for Hot Standby

Volume Control and Charging (VCC):

Train 1: Power cable: Lube Oil Cooling Fan MG-8BF
Charging Pump G-8B
Lube Oil Pump G-943
Control cable: MG-8BF
Train 2: Instrmentation cable: Volume Control Tank Level LT-1100
Train 3: Piping

Component Cooling Water (CCW):

Train 3: Piping

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-C, Sheet 3.

Effects of Fire on Hot Standby Capability

VCC Damage to cabling for the train 1 charging pump, associated support equipment and train 2 volume control tank level transmitter is not expected since all cables are routed in conduit and the area contains no in-situ combustibles.

In the unlikely event damage does occur, the train 2 charging pump will remain available. Damage to the train 1 charging pump and assocaited support equipment will result in loss of the pump. Damage to the train 2 VCT level transmitter may cause spurious operation of the RWST charging isolation and VCT isolation valves or a spurious trip of the train 2 charging pump. If the VCT isolation and RWST charging isolation valves fail close, the RWST charging isolation bypass valve will remain available. If the VCT isolation valve fails open, letdown flow will remain available to protect the charging pump. If the train 2 charging pump spuriously trips, the control trip bypass will remain available.

Damage to Volume Control and Charging piping is not expected.

CCW Damage to component cooling water piping is not expected as there are no components in the area which could be adversely affected by a fire.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

The North Pipe Tunnel is constructed entirely of reinforced concrete. One wall is 3-hour rated reinforced concrete. The remaining walls and floor are reinforced concrete. The roof is reinforced concrete. There is a concrete hatch which provides access to the yard area. There are no in-situ combustibles in the area. The construction features plus the lack of in-situ combustibles are expected to adequately mitigate the consequences of the fire and confine it to the area under consideration.

Normal shutdown is credited for a fire in this area. The equipment credited for safe shutdown has been demonstrated to remain available due to fire the fire barriers and spatial seperation in accordance with with 10CFR50 Appendix R, Section III.G.1.

UNIT 1 FUEL HANDLING BUILDING

The Unit 1 Fuel Handling Building is a reinforced concrete and concrete block structure which houses the spent fuel pool, the new fuel storage room, and the 480V switchgear room. The Fuel Handling Building is divided into three (3) areas.

The Fuel Handling Building contains components and/or cabling for the following systems, which can be used to achieve, maintain, or support safe shutdown:

- Reactor Coolant
- Volume Control and Charging
- Residual Heat Removal
- Component Cooling Water
- Saltwater Cooling
- Containment Ventilation
- Essential Electric
- Reactor Cycle Sampling
- Safety Injection
- Feedwater

The type of fire protection/detection equipment in or near this building consists of the following:

- Portable fire extinguishers.
- Ionization smoke detectors.
- A total flooding automatic Halon 1301 suppression system.
- Manual hose stations.

Fire Area/Zone	Contains Safe Shutdown Equipment	Contains Safety Related Equipment Not Required for Safe Shutdown	Page No.	Figure No.
1-FH-2-5	No	Yes	1/FH-1	8-A, 8-B
1-FH-42-6	No	No	1/FH-5	8-B
1-FH-14-7	Yes	Yes	1/FH-6	8-A

FIRE AREA/ZONE: 1-FH-2-5

AREA: 2228 sq.ft. **DESCRIPTION:** SPENT FUEL STORAGE ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	484 lbs.
Charcoal	0 lbs.
Plastics	110 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	2330 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	B/300
Fire Duration	0.03 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 9B
Portable Extinguishers	(1)4A:40B:C, (1)40B:C, (1)10A:60B:C in 9B
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	3hr/7, HC/below 42' el, CB/above 42' el
- Floors,Ceiling or Roof	HC/floor, NR/roof
- Fixed Openings	OP/6, OP/9B, OP/exterior
- Penetrations	C, NC/6, ND/4B,6 NP/6
- Doors(UL Class/Zone #)	(2)NR/9B

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE 1-FH-2-5

Location

Fuel Handling Building - El. 2'-0" - Spent Fuel Storage Room - 2228 square feet - Figs. 8-A, 8-B.

Combustible Material	Quantity
Class A combustibles	484 lbs
Plastic	110 lbs

Fire loading - 2330 Btu/sq ft
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - B/300 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 300 °F and would involve Class A combustibles and plastic.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

No automatic fire suppression or detection equipment is provided within the area. Manual fire fighting equipment is available in the area and in adjacent zone 1-TB-35-9B.

Construction

The walls of the area above the 42' elevation are non-rated 8 inch thick concrete block construction. The north, east, and west walls below the 42' elevation are non-rated reinforced concrete construction with an approximate thickness of 4 feet. The portion of the south wall common with the 480V switchgear room (1-FH-14-7) is 3 hour rated. The roof is non-rated metal deck with 1 inch thick rigid insulation. Two non-rated doors separate the area from the turbine deck (1-TB-35-9B). Ventilation duct penetrations are not provided with fire dampers.

Equipment Required For Hot Standby

None

Equipment Required For Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Effects of Fire on Hot Standby Capability

None

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

Spent Fuel Pool
Spent Fuel Racks
Spent Fuel

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figures 8-A and 8-B, sheet 3.

Conclusions

The low fire loading and the substantial construction of the walls preclude the propagation of the design basis fire beyond the boundaries defining the zone.

The design basis fire will not affect the capability to achieve and maintain cold shutdown, as there are no safe shutdown components or cables within the fire area.

FIRE AREA/ZONE: 1-FH-42-6

AREA: 905 sq.ft. **DESCRIPTION:** NEW FUEL STORAGE ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	3 lbs.
Class A	145 lbs.
Charcoal	0 lbs.
Plastics	15 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	1523 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	B/250
Fire Duration	0.02 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (2) in 9B
Portable Extinguishers	(1)20A:80B:C, (1)10A:60B:C in 9B
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	CB
- Floors,Ceiling or Roof	3hr/floor, NR/roof
- Fixed Openings	OP/5, LV/9B
- Penetrations	D, NC/5, NP/5, ND/5
- Doors(UL Class/Zone #)	NR/9B

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE: 1-FH-14-7

AREA: 1059 sq.ft. **DESCRIPTION:** 480V SWITCHGEAR ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	11469 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	138628 BTU's/sq.ft.
Fire Loading - Max Permissible	160000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1800
Fire Duration	1.73 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	halon
Hose Stations	none, (2) in 9A, (1) in 4D
Portable Extinguishers	(1)10B:C,(1)20B:C,(1)4A:40B:C, (1)8B:C#
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr/north; 1hr/9A; 2hr/*
- Floors,Ceiling or Roof	3hr/ceiling, HC/floor
- Fixed Openings	none
- Penetrations	P,D,C, QD/9B
- Doors(UL Class/Zone #)	(2)A/4D, A/9A

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			1,2
Volume Control & Charging			2,3
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			1,2
Saltwater Cooling			2
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			2

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			2
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			(1)(2)
Auxiliary Saltwater Cooling			(2)

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			J

SUMMARY

			1,2,3(1,2)J

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		2	
480 V (AC)		2,J	2
120 V (AC)	2	2	
125 V (DC)			
SUMMARY	2	2,J	2

SHUTDOWN SYSTEM CREDITED :Alternate: Charging

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :yes(SEE TEXT)
Spurious Operation :yes(SEE TEXT)

NOTES

\# - (1)10B:C in 9A
* - east,part. south, west

Location

Fuel Handling Building - El. 14'-0" - 480V Switchgear Room - 1059 square feet - Fig. 8-A.

Combustible Material	Quantity
Cable insulation	11,469 lbs

Fire loading - 138,628 Btu/sq ft
Maximum permissible fire loading - 160,000 Btu/sq ft
Heat Rate - E/1800 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1800 °F and would involve cable insulation.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

The area contains an automatic total flooding Halon 1301 suppression system actuated by the alarm of at least two cross-zoned ionization smoke detectors or by local manual control. The system consists of a sufficient quantity of Halon 1301 for two applications. Smoke dampers and doors are interlocked to automatically close upon actuation of the first smoke detector. Fire dampers installed in ducts are actuated by fusable links. Actuation of any ionization detector results in local, ESO office and control room alarm. Manual fire fighting equipment is available in the area and in adjacent zones 1-TB-8-9A and 1-YD-14-4D.

Construction

The north wall of the area is three hour rated. The west wall and the portion of the south wall adjoining the yard area are two hour rated concrete block construction. The east wall and the portion of south wall adjoining the turbine building are two hour rated concrete block construction. An automatic wet pipe sprinkler system in 1-TB-8-9A upgrades the fire rating of the south and east walls on the turbine building side to a 3 hour equivalent wall. The ceiling is 3 hour rated reinforced concrete construction with an approximate thickness of 6 inches. Two 3 hour rated doors separate the area from the yard

Construction (contd)

area (1-YD-14-4D). The area communicates with the ground floor of the turbine building (1-TB-8-9A) through a 3 hour rated door. The ventilation duct penetrations are 3-hour rated.

The installation of two 3 hour dampers (identified as non-rated in the matrix) in the wall communicating with fire zone 1-TB-35-9B does not meet the manufacturer's installation requirements An evaluation of the fire protection systems provided in the area, the combustible loading, the construction of the dampers, and the location of combustibles and safe shutdown circuitry in the vicinity of the dampers has been conducted to document the adequacy of the existing configuration.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC):	Train 2:	Power cable:	Bus 2C
480V (AC):	Train 2:	Switchgear 2	
		MCC-2	
		Power cable:	Switchgear 2
			MCC-2
			MCC-2A
			MCC-4B
		Control cable:	Switchgear 2
		Switchgear 4	
		Power cable:	Switchgear 4
			MCC-4
		Control Cable:	Switchgear 4
120V (AC):	Train 2:	Utility Bus (Y15)	
		Inverter 5 (YV29)	
		Vital Bus 6 (Y30)	
		Power cable:	Y15
			Vital Bus 5 (Y29)
			Y30
			YV29
			37.5/7.5 KVA Transformer

Reactor Coolant System (RCS):

Train 1:	Control cable:	Pzr Heaters Group C
Train 2:	Power cable:	Pzr Heaters Groups B & D
	Control cable:	Pzr Heaters Groups B & D

Volume Control and Charging (VCC):

Train 2:	Power cable:	Pump G-8A
	RWST Charging Isolation Valve MOV-1100D	
	Control cable:	Valve MOV-1100D
Train 3:	Control cable:	RWST Isolation Return Valve MOV-883

Equipment Required for Hot Standby (contd)

Component Cooling Water (CCW):

Train 1: Control cable: Pump G-15A
Train 2: Power cable: Pump G-15B
Heat Exchanger Outlet Valve MOV-720A
Control cable: G-15B
MOV-720A
Power cable: Pump G-15C
Control cable: G-15C

Saltwater Cooling (SWC):

Train 2: Power cable: Pump G-13B
Control cable: G-13B

Containment Ventilation (CVS):

Train 2: Power cable: Reactor Cavity Cooling Fan A-9S
Control cable: A-9S
Cooling Fan Control Damper PO-12

Equipment Required for Cold Shutdown

Residual Heat Removal (RHR):

Train 2: Power cable: Pump G-14B
Inlet Isolation Valve MOV-814
Heat Exchanger Inlet Valve MOV-822B
Discharge Isolation Valve MOV-834
Control cable: G-14B
MOV-814
MOV-822B
MOV-834

Equipment Required for High/Low Pressure Interface

Reactor Coolant System (RCS):

Train 2: Control cables: Reactor Vessel Vent SV-3401
SV-3402
Pzr High Point Vent SV-3403
SV-3404

Volume Control and Charging (VCC):

Train 2: Power cable: Letdown Containment Isolation Valve CV-526
Seal Water Isolation Return Valve CV-528

Spurious Operation Equipment

Reactor Coolant System (RCS):

Train 1: Control cable: Pump G-2A
Train 2: Control cable: Pump G-2B

Volume Control and Charging (VCC):

Train 2: Control cable: Test Pump G-42

Containment Spray and Recirculation (CRS):

Train 2: Power cable: Refueling Water Pump G-27S
Control cable: G-27S

Safety Injection (SIS):

Train 2: Power cable: Safety Injection Recirc Isolation Valve MOV-357
Control cable: MOV-357
Train 3: Power cable: Safety Injection Recirc Isolation Valve MOV-358
Control cable: MOV-358

Alternate Shutdown Equipment

Safety Injection (SIS):

Train 1: Power cable: Safety Injection Discharge Valve MOV-850B
Control cable: MOV-850B
Train 2: Power cable: Pump G-50A
Safety Injection Discharge Valve MOV-850A
Control cable: MOV-850A

Feedwater (FWS):

Train 2: Power cable: Lube Oil Cooler A-17A
Control cable: A-17A
Condenser Isolation Valve CV-37
RWST Isolation Valve CV-875B

Salt Water Cooling (SWC): Train 2: Power cable: Auxiliary SWC Pump G-13C
Control cable: G-13C

Dedicated Shutdown Equipment

Essential Electric Systems (EES):

480V (AC): Train 2: Power cable: MCC 4A

Reactor Cycle Sampling System (RSS):

Power cable: RCS Sample Isol Valve SV-3302
Control cable: SV-3302

Safety Related Equipment Not Required for Safe Shutdown

Essential Electric Systems:

480V (AC): SDG & E Intertie
120V (AC): Lighting Switchgear
Alt. Feed Lighting Swgr to Utility Bus
125V (DC): Train 1: Control cable: Switchgear 2
Train 2: Control cable: Switchgear 4

Reactor Coolant:

Train 2: Control cable: CV-992

Main Feedwater:

Train 2: Power cable: MOV-21 G-979
Control cable: MOV-21 G-979

Instrument Air:

Train 2: Power cable: Compressor 1B
Control cable: Compressor 1B
Power cable: Compressor 1C
Control cable: Compressor 1C

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to portions of the Train 2 4160V and 480V system may occur. The train 1 and dedicated systems and its associated cabling are located outside this fire area and will remain available.

Effects of Fire on Hot Standby Capability (contd)

Damage to portions of the train 2 120V system may occur. The train 1 system and its associated cabling are located outside this area and will remain available. Operator action may be necessary to mitigate the loss of the train 2 120V system.

RCS Damage to cabling for pressurizer heater groups B, C and D may occur. Operator action will be taken to deenergize these heaters. Pressurizer heater group A cables are routed outside this fire area and will remain available.

VCC Damage to cabling for the train 2 charging pump may occur. Cabling for dedicated shutdown system operation of the train 2 pump and its associated support equipment are located outside this fire area and will remain available if the train 1 charging pump is lost due to spurious opening of the volume control tank isolation valve.

Damage to cabling for the volume control tank isolation valve may cause spurious operation of the isolation valve. If the valve spuriously closes an automatic bypass around the RWST charging isolation valves will preclude loss of charging pump suction. If the valve spuriously remains open, with a loss of letdown, a low level signal from the volume control tank will trip the train 2 charging pump. Operator action will be taken to manually close the volume control tank isolation valve and initate dedicated system operation of the train 2 charging pump.

Damage to cabling for the train 2 RWST charging isolation valve may occur. Cabling associated with the train 1 valve are located outside this fire area and will remain available.

Damage to cabling for the RWST isolation return valve may occur. The valve will fail in its required safe shutdown position.

CCW Damage to cabling for the train 1 CCW pump may occur. Operator action may be required to manually start the pump.

Damage to cabling for the train 2 CCW pumps may occur. Cabling for the train 1 pump (except for remote start circuits addressed above) is located outside this fire area and will remain available.

Damage to cabling for the train 2 CCW heat exchanger outlet valve may occur. Cabling for the train 1 valve are located outside this fire area and will remain available.

SWC Damage to cabling for the train 2 saltwater cooling pump may occur. Cabling for the train 1 pump are located outside this fire area and will remain available.

Effects of Fire on Hot Standby Capability (contd)

CVS Damage to cabling for the train 2 reactor cavity cooling fan and associated control damper may occur. Cabling for the train 1 fan control damper are located outside this fire area and will remain available.

Effects of Fire on Cold Shutdown Capability

RHR Damage to cabling for the train 2 RHR pump may occur. Cabling for the train 1 pump is located outside this fire area and will remain available.

Damage to cabling for the train 2 RHR inlet isolation valve, discharge isolation valve, and heat exchanger inlet valve may occur. Cabling for the train 1 valves is located outside this fire area and will remain available.

Effects of Fire on High/Low Pressure Interface Equipment

RCS Damage to cabling for reactor vessel vent valves may occur. Operator action will be taken to isolate the vent line. Spurious actuation of the vent valves, until operator action is taken, has been evaluated and determined to be acceptable.

Damage to cabling for pressurizer high point vent valves may occur. Operator action will be taken to isolate the vent line. Spurious actuation of the vent valves, until operator action is taken, has been evaluated and determined to be acceptable.

VCC Damage to cabling for the letdown containment isolation valve and seal water return isolation valve may occur. The valves will fail to their required safe shutdown position.

Consequences of Spurious Operation

RCS Damage to cabling for the reactor coolant pumps may cause spurious operation of the pumps. Operator action will be taken to deenergize the pumps.

VCC Damage to cabling for the charging system test pump may cause spurious operation of the pump. Operator action will be taken to deenergize the pump.

Consequences of Spurious Operation (contd)

CRS Damage to cabling for the refueling water pump may cause spurious operation of the pump. Operator action will be taken to deenergize the pump.

SIS Damage to cabling for the safety injection recirculation valves may cause spurious operation of the valves. Spurious actuation of these valves will divert flow from the seal injection flowpath to the safety injection flowpath. The effects of the spurious actuation have been evaluated and determined to be acceptable.

Effects of Fire on Alternate Shutdown Equipment

SIS Damage to cabling for the safety injection pump and valves may occur. The use of this equipment is not credited for safe shutdown in this fire area.

FWS Damage to cabling for the condenser isolation and RWST storage isolation valves may occur. The use of this equipment is not credited for safe shutdown in this fire area. Operator action will be taken to trip the main feedwater pumps to prevent feedwater flow to the RWST.

Damage to cabling for the main feedwater pump lube oil cooler may occur. The use of this equipment is not credited for safe shutdown for this fire area.

SWC Damage to cabling for the auxiliary saltwater cooling pump may occur. The use of this equipment is not credited for safe shutdown for this fire area.

Effects of Fire on Dedicated Shutdown Equipment

EES Damage to cabling for portions of the 480V dedicated shutdown system may occur. The use of this equipment is not credited for safe shutdown for this area.

RSS Damage to cabling for the RCS sample isolation valve may occur. The use of this equipment is not credited for safe shutdown for this area.

Conclusions

The ionization detection system is expected to detect the products of combustion from an incipient fire and alert the ESO office and control room. Manual fire fighting equipment available in the area is sufficient to suppress the fire. The Halon 1301 suppression system may also be used, either by automatic actuation or manual actuation, to control and suppress the fire.

One train of systems necessary to achieve and maintain hot standby and cold shutdown conditions independent of the subject fire area have been demonstrated to remain free of fire damage due to spatial seperation and fire barriers provided. Alternate shutdown is credited for a fire in this zone. Based on the area construction, the detection and suppression capability provided , this fire area is in compliance with the criteria of 10CFR50, Appendix R, Section III.G.1. and III.G.3.

FIRE AREA/ZONE: 1-TB-8-9A

AREA: 25438 sq.ft. **DESCRIPTION:** TURBINE, BUILDING, GROUND FLOOR

COMBUSTIBLES

Oil & Grease	118435 lbs.
Cable (30% Fill)	51113 lbs.
Class A	25 lbs.
Charcoal	0 lbs.
Plastics	483 lbs.
Miscellaneous	502 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	109860 BTU's/sq.ft.
Fire Loading - Max Permissible	160000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1800
Fire Duration	1.37 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	wet pipe, water spray, AFFF
Hose Stations	(7), (1) in 4D
Portable Extinguishers	(2)160B:C(8)10A:60B:C(3)10B:C(1)4A:40B:C
Detectors (Type)	heat, ionization, infrared (all local)

FIRE RESISTANCE RATING

- Walls	3hr/8,10, 3hr eq/7,4A,B,HC or CB/other
- Floors,Ceiling or Roof	HC
- Fixed Openings	OP/4D,9D,4F, MH/9C,25, CH/9B, LV/9B,9D
- Penetrations	D,C,P, NC/9B,9D,4F,25,4D, NP/9B,9D,4F,4D
- Doors(UL Class/Zone #)	A/7,8,9D,10, B/4F,(2)NR/4D,NR/4F

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			1,2,(1)
Volume Control & Charging			1,2,3
Main Steam	2	2	1,2
Auxiliary Feedwater	1	1,3	1
Component Cooling Water			1,2,(1)
Saltwater Cooling			1,2
Diesel Generator			
Gaseous Nitrogen			2
Containment Ventilation			1,2

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			1,2
Component Cooling Wtr (to RHR)			1

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)	1,2	1,2	1,2,3
Auxiliary Saltwater Cooling			2

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY	1,2,(1),(2)	1,2,3,(1)(2)	X,1,2,3(123)

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)	2		
480 V (AC)	1,2	2	
120 V (AC)	1,2		
125 V (DC)			
SUMMARY	1,2	2	

SHUTDOWN SYSTEM CREDITED :Dedicated

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :YES(SEE TEXT) # (2)10A:80B:C
Spurious Operation :YES(SEE TEXT)

NOTES

FIRE AREA/ZONE 1-TB-8-9A

Location

Turbine Building - El. 8'-6" - Turbine Building, Ground Floor - 25,438 square feet - Fig. 8-A.

Combustible Material	Quantity
Oil	16,000 gals
Grease	5 gals
Cable insulation	51,113 lbs
Class A combustibles	25 lbs
Plastic	483 lbs
Solvent	76 gal

Fire loading - 109,860 Btu/sq ft
Maximum permissible fire loading - 160,000 Btu/sq ft
Heat Rate - E/1800 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1800 °F and would involve oil, grease, cable insulation, Class A combustibles, plastic, and miscellaneous combustibles.

The maximum credible fire is limited by the zone's large floor area and the localized nature of the combustible loading. The design basis fire is expected to be limited to a fire in the vicinity of one of the following hazards: the lube oil reservoir, the west feedwater pump area, the hydrogen seal oil unit, or the exciter area.

The fire loading is conservatively based on the simultaneous total combustion of all combustibles in the zone.

FIRE AREA/ZONE 1-TB-8-9A

Fire Protection Equipment

An automatic wet pipe sprinkler system is provided for protection of the chemical feed area. An automatic wet pipe sprinkler system also protects the north wall of the chemical treatment area, the east wall and a portion of the south wall of the 480V switchgear room, and the structural steel at the north end of the zone.

An aqueous film forming foam (AFFF) system is provided for the lube oil reservoir pump and conditioner areas. Cross-zoned infrared flame detectors are installed over the tanks for automatic actuation of the system.

Automatic water spray systems protect the cable trays routed in the north portion of the zone near the lube oil and chemical feed areas. Line-type heat detection is installed in the protected cable trays for automatic actuation of the water spray systems. In addition, an automatic water spray system with infrared flame detector actuation provides coverage of the hydrogen seal oil unit located in the south portion of the zone.

Ionization smoke detectors, located at hazard areas within the zone, provide early warning alarm in the ESO office and control room.

Manual fire fighting equipment is also available within the zone and in adjacent zones 1-PB-20-11A, 1-YD-14-4F, and 1-YD-14-4D, and areas 1-PB-14-8 and 1-FH-14-7.

Construction

The north wall of the zone, separating the zone from adjacent area 1-PB-14-8, is 3 hour rated. The wall adjoining the penetration area (1-YD-20-4A and 1-YD-20-4B) is 1 hour rated. The walls adjoining the east and south with the 480V switchgear room (1-FH-14-7) are 2 hour rated. An automatic wet pipe sprinkler system is provided to upgrade the protection of these walls to a 3 hour equivalent rating. The walls of the lube oil storage shed are 3 hour rated reinforced concrete. The remainder of the zone walls are of non-rated concrete block or reinforced concrete construction. A sheet metal equipment access hatch is provided in the south wall of the zone. Non-rated doors communicate with the yard area (1-YD-14-4D). A 1-1/2 hour rated door and a non-rated door open to the adjacent condensate storage tank area (1-YD-14-4F). Four 3 hour rated doors allow access to the 480V switchgear room (1-FH-14-7), the main transformer area (1-TB-20-9D), the 4160V switchgear room (1-PB-14-8), and the lube oil storage shed (1-TB-14-10) from the zone. There are no ventilation duct penetrations.

Equipment Required for Hot Standby

Essential Electrical Systems (EES):

4160V(AC):	Train 2:	Power cable: Bus 2C Control cable: Bus 2C
480V(AC):	Train 1:	Power cable: Switchgear 1 & 3 Control cable: Switchgear 1 & 3
	Train 2:	Power cable: MCC-4B Control cable: Switchgear 4 MCC-4 Power cable: MCC-4 Control cable: Switchgear 4
120V(AC):	Train 1:	Power cable: 37.5kVA Transformer
	Train 2:	Power cable: Utility Bus Y-15

Reactor Coolant System (RCS):

	Train 1:	Power cable: Pzr Heater Group A & C Control cable: Pzr Heater Group A & C Block Valve CV-531 PORV CV-545 CV-546 Instrumentation cable: Pzr Level LT-431 Cold Leg Temperature TE-402C TE-3412C TE-422C
	Train 2:	Control cable: Pzr Heaters Group B & D Instrumentation cable: Pzr Level LT-435

Volume Control and Charging (VCC):

	Train 1:	Power cable: Charging Pump G-8B Pump G-943 Fan MG-8BF RWST Charging Isolation Valve MOV-1100B Control cable: G-943 MOV-1100B MG-8BF Charging Flow Control Valve FCV-1112 Instrumentation cable: Charging Flow FT-1112

Equipment Required for Hot Standby (contd)

Volume Control and Charging (VCC):

Train 2: Power cable: Charging Pump G-8A
RWST Charging Isolation Valve MOV-1100D
Control cable: Pump G-942
Fan MG-8AF
Seal Injection Flow Control valve FCV-1115A
FCV-1115B
FCV-1115C
RWST Charging Isolation Valve MOV-1100D
Instrumentation cable: RCP Seal Flow Pressure PT-1115A
PT-1115B
PT-1115C

Train 2: Power cable: RWST Isolation Valve MOV-883
Control cable: MOV-883

Train 3: Power cable: RWST Isolation Valve MOV-883
Control cable: MOV-883

Main Steam (MSS):

Train 1: Power cable: S/G Blowdown Control Valves CV-100/100B
Control cable: Steam Dump Control Valve Solenoid
SV-85
SV-86
SV-87
SV-88
Turbine Stop Valve Actuator
PV-1611
PV-1612
Instrumentation cable: S/G Level LT-2400A
LT-2400B
LT-2400C

Train 2: Main Steam Pressure PT-459
Control cable: Atmospheric Steam Dump Air Controller PC-418A
Instrumentation cable: PT-459

Train 2: Reheater Isolation Valve MOV-14
MOV-15
MOV-16
MOV-17

Power cable: MOV-14
MOV-15
MOV-16
MOV-17

Control cable: MOV-14
MOV-15
MOV-16
MOV-17

Equipment Required for Hot Standby (contd)

Auxiliary Feedwater (AFW):

Train 1: Motor Driven Pump G-10S
Discharge Valve MOV-1202
Power cable: G-10S
MOV-1202
Control cable: G-10S
MOV-1202
Piping and valves
Turbine Driven Pump G-10
Pump Turbine X-1062
Steam Supply Bypass Control Valve SV-2613
Steam Line Drain Valve: SV-2615
SV-2616
SV-2617
SV-2619
SV-2621
SVC Water Inlet to G-10 SV-2618
Discharge Valve CV-2620
Steam Supply Valve CV-2614
Steam Supply Pressure Control CV-113
Control cable: CV-2614
CV-2620
SV-2613
SV-2614
SV-2615
SV-2616
SV-2617
SV-2618
SV-2619
SV-2620
SV-2621

Train 3: Piping and valves

Component Cooling Water (CCW):

Train 1: Power cable: Pump G-15A
Heater Exchanger Outlet Valve MOV-720B
Control cable: G-15A
MOV-720B

Train 2: Control cable: Pump G-15B
Heat Exchanger Outlet Valve MOV-720A
Pump G-15C

Equipment Required for Hot Standby (contd)

Saltwater Cooling (SWC):

Train 1:	Power cable:	Pump G-13A
	Control cable:	G-13A
Train 2:	Control cable:	Pump G-13B

Containment Ventilation (CVS):

Train 1:	Power cable:	Fan A-9
	Control cable:	A-9
		Control Damper PO-11
Train 2:	Power cable:	Fan A-9S
	Control cable:	A-9S
		Control Damper PO-12

Gaseous Nitrogen: (GNI)	Train 2:	Control cable:	PORV Nitrogen Supply Control Valve CV-532

Equipment Required for Cold Shutdown

Residual Heat Removal (RHR):

Train 1:	Power cable:	Pump G-14A
		Inlet Isolation Valve MOV-813
		Heat Exchanger Inlet Valve MOV-822A
		Discharge Isolation Valve MOV-833
	Control cable:	MOV-813
		MOV-822A
		MOV-833
		Flow Control Valve HCV-602
	Instrumentation cable:	Inlet Temp TE-600
		Heat Exchanger Disch Temperature TE-601A
		TE-601B
Train 2:	Power cable:	Pump G-14B
		Inlet Isol Valve MOV-814
		Heat Exch Inlet Valve MOV-822B
		Discharge Isol Valve MOV-834
	Control cable:	MOV-814
		MOV-822B
		MOV-834

Component Cooling Water (CCW):

Train 1:	Control cable:	RHR Heat Exchanger Flow Control Valve TCV-601A
		TCV-601B

High/Low Pressure Interface Equipment

Volume Control and Charging (VCC):

Train 2: Power cable: Letdown Containment Isolation Valve CV-526
Seal Water Return Isolation Valve CV-528
Control cable: CV-526
CV-528

Spurious Operation Equipment

Reactor Coolant System (RCS):

Train 1: Control cable: RCP G-2A
RCP G-2C
Pressurizer Spray Valve PCV-430C
PCV-430H

Train 2: Control cable: RCP G-2B

Volume Control and Charging (VCC):

Train 1: Instrument Cable: VCT Level LT 2550

Train 2: Control cable: FCV-1115D
FCV-1115E
FCV-1115F
Primary Water Makeup Valve FCV-1102A
Boric Acid Pump Discharge Valve FCV-1102B
Boric Acid Supply Valve CV-334
Letdown Containment Isolation Valve CV-526
Test Pump G-42
Chemical Blending Control Valve CV-406A
Chemical Blending Control Valve CV-406B
Letdown Isolation Valve LCV-1112
Letdown Orfice Isolation Valve CV-202
CV-203
RCS Excess Letdown to RHR Isolation Valve CV-414

Spurious Operation Equipment (contd)

Volume Control and Charging (VCC):

Train 2: Control Cable (contd):
- Demineralizer Bypass Valve TCV-1105
- Letdown Flow to Radwaste Valve LCV-1100A
- Low Pressure Letdown Valve PCV-1105

Main Steam (MSS):

Train 1:
- Condenser Steam Dump Isolation Valve CV-3, CV-4
- Condenser Steam Dump Solenoid Valve SV-89, SV-90
- Main Turbine Stop Bypass Valve CV-140, CV-141
- S/G Sample Isolation Valve SV-119, SV-120, SV-121, SV-122, SV-123, SV-124
- Condenser Steam Dump Control Valve SV-176
- Control cable: CV-3, CV-4, SV-89, SV-90, SV-119, SV-120, SV-121, SV-122, SV-123, SV-124, SV-176

Auxiliary Feedwater (AFW):

Train 1:
- Bypass Isolation Valve MOV-1204
- Power cable: MOV-1204
- Control cable: MOV-1204

Containment Spray and Recirculation (CRS):

Train 2:
- Control cable: Refueling Water Pump G-27S

Train 1:
- Control Cable: Containment Spray Valve CV-114

Spurious Operation Equipment (contd)

Safety Injection (SIS):

Train 1: Power cable: Safety Injection Recirc Valve MOV-356
Control cable: MOV-356
Train 2: Control cable: Safety Injection Recirc Valve MOV-357
Train 3: Power cable: Safety Injection Recirc Valve MOV-358
Control cable: MOV-358

Alternate Shutdown Equipment

Reactor Coolant System (RCS):

Train 1: Instrumentation cable: Delta T: TE-400A
TE-2400C
TE-410A
TE-412C
TE-420A
TE-420C

Component Cooling Water (CCW):

Train 1: Control Cable: Thermal Barrier Coil Return Valve CV-722A
CV-722B
CV-722C

Safety Injection (SIS):

Train 1: Safety Injection Return Valve HV-851B
Safety Injection Feed Valve HV-853B
Safety Injection Return Valve Solenoid SV-528
Safety Injection Feed Valve Solenoid SV-530
Power cable: Pump G-50B
Safety Injection Discharge Valve MOV-850B
Control cable: SV-528
SV-530
MOV-850B
HV-851B
HV-853B
G-50B

Alternate Shutdown Equipment (contd)

Train 2: Safety Injection Return Valve HV-851A
Safety Injection Feed Valve HV-853A
Safety Injection Return Valve Solenoid SV-524
Safety Injection Feed Valve Solenoid SV-526
Power cable: Pump G-50A
Safety Injection Discharge Valve MOV-850A
Control cable: SV-524
SV-526
MOV-850A
HV-853A
HV-851A
G-50A

Train 3: Power cable: Safety Injection Discharge Valve MOV-850C
Control cable: MOV-850C

Main Feedwater (FWS):

Train 1: Main Feedwater Pump G-3B
Lube Oil Cooler Fan A-17B
Lube Oil Cooler E-17B
Lube Oil Pump G-980
Outlet Isolation Valve HV-852B
Inlet Isolation Valve HV-854B
Outlet Isolation Valve Solenoid SV-529
Inlet Isolation Valve Solenoid SV-531
Power cable: G-3B
A-17B
Control cable: A-17B
SV-529
SV-531
HV-852B
HV-854B

Train 2: Main Feedwater Pump G-3A
Lube Oil Cooler Fan A-17A
Feedwater to Condenser Isolation Valve CV-36
CV-37
RWST Isolation Valve CV-875A
CV-875B
Lube Oil Cooler E-17A
Lube Oil Pump G-979
Outlet Isolation Valve HV-852A
Inlet Isolation Valve HV-854A
Outlet Isolation Valve Solenoid SV-525
Inlet Isolation Valve Solenoid SV-527

Alternate Shutdown Equipment (contd)

Main Feedwater (FWS) (contd)

Power cable: G-3A
A-17A
Control cable: A-17A
CV-36
CV-37
CV-875A
CV-875B
SV-525
SV-527
HV-852A
HV-854A

Saltwater Cooling (SWC):

Train 2: Control cable: Auxiliary Pump G-13C

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

Main Steam (MSS):

Train 1: Instrumentation cable: FT-460
FT-461
FT-462

Main Feedwater System (FWS):

Train 1: Lube Oil Cooler Pump G-17B
Power cable: G-17B
MOV-20
Control cable: FCV-456
FCV-457
FCV-458
Instrumentation cable: FT-456
FT-457
FT-458
Train 2: Lube Oil Cooler Pump G-17A
Power cable: G-17A
Train 3: Power cable: LT-453
LT-454
LT-455
Instrumentation cable: LT-453
LT-454
LT-455

Volume Control and Charging (VCC):

Train 2: Control cable: CV-305
CV-304

Safety Related Equipment Not Required for Safe Shutdown (contd)

Safety Injection (SIS):

Train 1:	Instrumentation cable:	FT-912
Train 2:	Instrumentation cable:	FT-913
Train 3:	Instrumentation cable:	FT-914

Essential Electric Systems (EES):

120V (AC):	Control cable:	Lighting Swgr to Utility Bus (Alt. feed)

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Shutdown Capability

EES Damage to cabling for train 1 and 2 essential electrical systems may occur. Dedicated shutdown will be used for a fire in this zone. Operator action may be required to manually align valves to required safe shutdown position.

RCS Damage to cabling for PORVs and block valve may occur. Operator action is required to deenergize power to prevent spurious operation. Spurious operation of the PORVs until operator action is taken has been evaluated and determined to be acceptable. Cables for dedicated shutdown system operation of one PORV are located outside the fire zone and will remain available.

Damage to cabling for pressurizer heater groups A, B, C, and D may occur. Operator action will be required to deenergize normal power to the pressurizer heaters and to transfer control of the required portion of pressurizer heater group D to the dedicated shutdown panel. Cables for dedicated shutdown system operation of pressurizer heater group D are routed outside the fire zone and will remain available.

Damage to cabling for RCS instrumentation may occur. Cables for instrumentation located at the dedicated panel are routed outside this fire zone and will remain available for safe shutdown.

Effects of Fire on Hot Standby Capability (contd)

VCC Damage to cabling for train 1 and 2 charging pumps and charging pump support equipment may occur. Operator action will be taken to transfer control of the train 2 pump and its support equipment to the dedicated shutdown panel. The cabling required for dedicated shutdown system operation of the charging system is located outside this fire zone and will remain available. Interruption of seal injection and seal cooling to the RCP seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

Damage to cabling for the RWST isolation valve may occur. The valve will fail as is, in thes normally open position, as required for safe shutdown.

Damage to cabling for the volume control tank isolation and RWST charging isolation valves may cause spurious operation of the valves. If the VCT and RWST charging isolation valves fail close, an automatic bypass around the RWST charging isolation valves will preclude loss of charging pump suction flow path. If the VCT isolation valve spuriously remains open, with a loss of letdown, a low level signal from the volume control tank will trip the train 2 charging pump. Operator action will be taken to manually close the volume control tank isolation valve and verify that one of the RWST charging isolation valves are open.

Damage to cabling for the charging flow control valve and flow transmitter may occur. Operator action will be taken to transfer valve control to the dedicated shutdown panel. The cabling required for dedicated shutdown system operation of the valve is located outside this fire zone will remain available.

Damage to the cabling for the seal injection flow control valves and RCP seal flow pressure transmitters may occur. Operator action will be taken to fail open the seal injection flow control valves, verify closed the seal water supply valves, and control flow using manual valves located upstream of the charging flow control valve.

MSS Damage to cabling for the atmospheric steam dump valves may occur. Operator action will be taken to deenergize power to prevent spurious operation. Spurious actuation of the steam dump valves until operator action is taken has been evaluated and determined to be acceptable.

Damage to the main steam pressure transmitter and cabling for atmospheric steam dump air controller may occur. Operator action will be taken to deenergize power to prevent spurious operation of condenser and main steam line atmospheric dump valves due to erroneous control singal from the steam dump air controller. Spurious actuation of the steam dump valves until operator action is taken has been evaluated and determined to be acceptable.

Effects of Fire on Hot Standby Capability (contd)

Damage to reheater isolation valves may occur. Operator action will be taken to manually close these valves. Spurious operation of these valves until the operator action is taken has been evaluated and determined to be acceptable.

Damage to cabling for the turbine stop valve actuators may occur. Operator action will be taken to trip the turbine at the turbine stand. Spurious operation of these valves, until operator action is taken to manually trip the turbine has been evaluated and determined to be acceptable.

Damage to cabling for control room steam generator level instrumentation may occur. Cables for the dedicated instrumentation is located outside this fire zone and will remain available at the dedicated shutdown panel.

Damage to cabling for steam generator blowdown control valves may occur. Operator action will be taken to manually close valves upstream of these valves. Spurious operation of these valves until operator action has been taken has been evaluated and determined to be acceptable.

AFW Damage to the auxiliary feedwater pumps and their associated valves may occur. The west (dedicated) auxiliary feedwater pump and cables are located outside this fire zone and will remain available. Loss of auxiliary feedwater flow until operator action is taken to initiate auxiliary feedwater flow from the dedicated shutdown system has been evaluated and determined to be acceptable.

CCW Damage to cabling for the train 1 and 2 component cooling water pumps and their associated valves may occur. Interruption of seal injection and seal cooling to the reactor coolant pump seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

SWC Damage to cabling for the train 1 and 2 saltwater cooling pumps may occur. The saltwater cooling system is not required to support dedicated shutdown system operation.

CVS Damage to cabling for containment ventilation cooling fans and associated control dampers may occur. The reactor cavity cooling fans are required only to support operation of the source range monitors. During operation of the dedicated shutdown system, shutdown margin will be determined by sampling the primary system boron concentration.

GNI Damage to cabling for the PORV nitrogen supply valve may occur. Operator action will be taken to open the manual bypass to supply nitrogen for operation of the PORVs and block valves from the dedicated shutdown panel.

Effects of Fire on Cold Shutdown Capability

RHR Damage to cabling for RHR pumps may occur. The dedicated auxiliary feedwater pump will remain available for single phase cooldown.

Damage to cabling for RHR inlet isolation valves, heat exchanger inlet valves, discharge isolation valves, and flow control valve and associated temperature indication may occur. These valves are not required for single phase cooldown. The high/low pressure boundary will be maintained by the train 1 inlet isolation valve which fails in its required safe shutdown position.

CCW Damage to cabling to the CCW control valves for the RHR heat exchangers may occur. The CCW system is not required to support dedicated shutdown system single phase cooldown.

Effects of Fire on High/Low Pressure Interface

VCC Damage to cabling for train 2 letdown containment isolation valve and seal water return isolation valve may occur. Operator action will be taken to deenergize power to fail the valves closed and to prevent spurious operation. Spurious actuation of the valve until operator action is taken to deenergize the valves has been evaluated and determined to be acceptable.

Consequences of Spurious Operation

RCS Damage to cabling for the reactor coolant pumps and pressurizer spray valves may cause spurious operation of the components. Turbine trip will deenergize the reactor coolant pumps. Spurious actuation of the pressurizer spray valves will not impact shutdown since the RCPs will be tripped.

VCC Damage to cabling for the charging system test pump may cause spurious operation of the pump. Operator action to trip offsite and diesel generator power will deenergize this pump.

Damage to cabling for G8B Low VCT Level Trip could trip the pump. Dedicated shutdown system power to G8A can be utilized.

Damage to cabling for the letdown valves may cause spurious operation. Charging suction path via RWST will remain available.

Damage to cabling for sealwater supply valves may cause spurious operation of the valves. Operator action will be taken to deenergize power to prevent/mitigate their spurious operation. These valves will fail to the desired safe shutdown position on loss of power.

Damage to cabling for primary water makeup control valve and letdown containment isolation valve may cause spurious operation of the valves. Operator action will be taken to deenergize power to prevent spurious operation. The primary water makeup control valve will fail in its required safe shutdown position on loss of power. Spurious actuation of the valves until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

Consequences of Spurious Operation (cont)

Damage to cabling for boric acid pump discharge and supply control valves may cause spurious operation of the valves. Operator action will be taken to close manual valves located downstream of primary water makeup control valve and upstream of the boric acid supply control valve. This action will also provide isolation from possible spurious operation of letdown demineralizer control valve and/or the chemical blending control valve.

MSS Damage to condenser steam dump isolation valves and their associated control solenoids, turbine main stop bypass valve, S/G sample isolation valves and alternate condenser steam dump control valve may cause spurious operation. Operator action is required to deenergize power to these components to prevent/mitigate spurious operation.

AFW Damage to auxiliary feedwater pump bypass isolation valve may cause spurious operation of the valve. This valve is not required for dedicated shutdown system single phase cooldown.

CRS Damage to cabling for the train 2 refueling water pump may cause spurious operation of the pump. Operator action is required to trip offsite/diesel generator power in order to deenergize the pump.

Damage to Train 1 Containment Spray Valve may occur. Manual action will be taken to close manual valves located up stream to isolate containment spray.

SIS Damage to cabling for safety injection recirculation valves may cause spurious operation of the valves. The train 1 valve will fail as is to its required safe shutdown position. The effects of this spurious operation have been evaluated and determined to be acceptable.

Effects of Fire on Alternate Shutdown Equipment

RCS Damage to cabling may cause erroneous indication of RCS delta T instruments. The corresponding dedicated shutdown system instrumentation are located outside this fire zone and will remain available.

CCW Damage to cabling for the thermal barrier coil return control valves may cause spurious operation of the valves. Interruption of seal injection and seal cooling to the reactor coolant pump seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

Effects of Fire on Alternate Shutdown Equipment (contd)

SIS Damage to safety injection pumps and associated valves may occur. This will have no impact on safe shutdown since the main feedwater and safety injection pumps will be tripped.

FWS Damage to main feedwater pumps and associated lube oil pumps, coolers and fans may occur. No mitigation is required as the offsite and diesel generator power will be tripped.

SWC Damage to cabling for auxiliary saltwater pump may occur. No mitigation is required as the saltwater cooling system is not required to support dedicated shutdown system single phase cooldown.

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusion

The automatic fire detection and suppression systems installed for the ground floor of the Turbine Building provide local coverage of the fire hazards in this fire zone. The fire detection systems are expected to provide adequate early warning to the ESO office and control room. The automatic aqueous film forming foam (AFFF) system protecting the lube oil reservoir pump and conditioner areas provides adequate suppression capabilities for the hazards. The automatic water spray systems protecting the cable trays in the north portion of the zone and the hydrogen seal oil unit, and the sprinkler system protecting the chemical feed area also provide adequate protection for the hazards. The sprinkler system provided for the north wall of the chemical treatment area, the east wall and a portion of the south wall of the 480V switchgear room, and the structural steel at the north end of the zone increase the fire suppression capability in the zone and upgrade the fire rating of the associated boundaries to 3 hours. Manual fire fighting equipment is also provided in this zone and in adjacent zones. The fire protection features provided in this zone are expected to adequately mitigate the consequences of the fire and confine it to this zone.

The dedicated safe shutdown system is credited for this fire zone. The NRC has reviewed and approved the dedicated safe shutdown system for this area. The dedicated equipment and instrumentation credited for a fire in this zone have been demonstrated to remain available for safe shutdown due to the fire barriers created, the spacing separation, and the time elements involved for operator actions. An exemption to the requirements of 10CFR50 Appendix R, Section III.G.3 has been granted for partial area detection and suppression.

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FIRE AREA/ZONE: 1-TB-35-9B

AREA: 24290 sq.ft. **DESCRIPTION:** TURBINE DECK

COMBUSTIBLES

Oil & Grease	155 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	115 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	E/250
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	(6)
Portable Extinguishers	(2)10B:C, (1)160B:C, (3)10A:60B:C,#
Detectors (Type)	ionization in HP turbine

FIRE RESISTANCE RATING

- Walls	3hr/16, NR/1, HC or CB others
- Floors,Ceiling or Roof	HC/floor, no roof
- Fixed Openings	CH/9A, LV/9A,6, OP/5, OP/4B
- Penetrations	C, NP/9A, NC/9A, QD/7
- Doors(UL Class/Zone #)	(2)NR/1,5, NR/6, C/31B

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			1,2
Volume Control & Charging			2
Main Steam		1,2	1,2
Auxiliary Feedwater			1,2
Component Cooling Water			(1)
Saltwater Cooling			
Diesel Generator			2
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			J

SUMMARY

	1,2	1,2,J,(1)

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			2
125 V (DC)			
SUMMARY			2

SHUTDOWN SYSTEM CREDITED :Alternate:RCS Temp. Indication

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :YES(SEE TEXT)
Spurious Operation :YES(SEE TEXT)

NOTES

- (1)10A:80B:C. (2)10A:60B:C

FIRE AREA/ZONE 1-TB-35-9B

Location

Turbine Building - El. 35'-0" - Turbine Deck - 24,290 square feet - Fig. 8-B.

Combustible Material	Quantity
Lubricating oil	21 gals

Fire loading - 115 Btu/sq ft
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - E/250 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 250 °F and would involve lube oil.

The maximum credible fire in the zone is limited by the zone's large floor area and the localized nature of the combustible loading. The design basis fire is expected to be limited to a fire involving the crane lube oil or a transient combustible fire. The fire loading is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic fire suppression equipment is provided for this zone. Ionization smoke detectors, located in the high pressure turbine housing, provide early warning alarm in the ESO office and control room. Manual fire fighting equipment is available within the zone and in adjacent zone 1-PB-42-31A.

Construction

The zone consists of the turbine and feedwater heater decks. The walls separating the zone from the control room complex (1-PB-42-16) are 3 hour rated. A non-rated steel wall separates the zone from containment (1-CO-(-10)-1). The remaining walls and floor are non-rated reinforced heavy concrete or concrete block with a minimum thickness of 8". No roof is provided. A non-rated steel personnel access hatch and a non-rated steel equipment access hatch open to containment (1-CO-(-10)-1). A non-rated sliding steel door and a non-rated rolling metal door communicate with the spent fuel storage room (1-FH-2-5). A non-rated metal rolling door opens to the new fuel storage room (1-FH-42-6). A 3/4 hour rated door provides access to the south stairwell/ locker room (1-PB-20-31B). Louvered ventilation openings communicate with the turbine building ground floor (1-TB-8-9A) and the new fuel storage room.

The installation of two 3 hour dampers (identified as non-rated in the matrix) in the wall communicating with fire zone 1-FH-14-7 does not met the manufacturer's installation requirements. An evaluation of the fire protection systems provided in the area, the combustible loading, the construction of the dampers, and the location of combustibles and safe shutdown circuitry in the vicinity of the dampers has been conducted to document the adequacy of the existing configuration.

Equipment Required for Hot Standby

Essential Electrical System (EES):

120V(AC): Train 2: Power cable: Vital Bus 5 (Y-29)

Reactor Coolant System (RCS):

Train 1: Instrumentation cable: Pressurizer Pressure
PT-430
PT-431
Hot Leg Temperature
TE-2401A
TE-2412A
TE-2422A

Train 2: Instrumentation cable: Pressurizer Pressure
PT-425
Hot Leg Temperature
TE-3402A
TE-3411A
TE-3421A

Volume Control and Charging (VCC):

Train 2: Instrumentation Cable: Volume Control Tank Level Transmitter LT-1100
Control cable: RWST Charging Isolation Valve MOV-1100D

Main Steam (MSS):

Train 1: Turbine Stop Valve Actuator PV-1611
PV-1612
Control cable: PV-1611
PV-1612

Train 2: Turbine Stop Valve PV-1650
PV-1651
Instrumentation cable: S/G Level LT-3400A
LT-3400B
LT-3400C

Auxiliary Feedwater (AFW):

Train 1: Control cable: Motor Driven Pump G-10S
Discharge Valve MOV-1202
Flow Control Valve
FCV-2300 A, B & C

Equipment Required for Hot Standby (contd)

Auxiliary Feedwater (AFW) (contd)

Train 2: Control cable: Pump G-10 W Disch, Valve SV-3110

Diesel Generator (DG):

Train 2: Control cable: Exciter Cabinet E09
DG Local Control Panel C-40

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

Reactor Coolant System (RCS):

Train 1: Power cable: Reactor Vessel Vent Valve SV-2401
SV-2402
Pressurizer High Point Vent Valve SV-2403
SV-2404

Train 2: Control cable: Reactor Vessel Vent Valve SV-3401
SV-3402
Pressurizer High Point Vent Valve SV-3403
SV-3404

Spurious Operation Equipment

Auxiliary Feedwater (AFW):

Train 1: Control cable: Bypass Isolation Valve MOV-1204

Alternate Shutdown Equipment

Component Cooling Water (CCW):

Train 1: Power cable: RCP Thermal Barrier Pump G-964
Control cable: G-964

Dedicated Shutdown Equipment

Essential Electrical System (EES):

220kV: Control cable: Offsite Power Circuit Breaker: Pos 1 PCB #1
Pos 1 PCB #2
Pos 3 PCB #5
Pos 3 PCB #6

Post Accident Sampling System (PAS):

Train J: Control cable: Reactor Coolant Inlet Isolation Valve CV-2023

Reactor Cycle Sampling System (RSS):

Train 1: Power cable: PASS Reactor Coolant Loop C Sample Valve CV-956
Train J: Control cable: RCP Sample Isolation Valve SV-3302

Safety Related Equipment Not Required for Safe Shutdown

Reactor Coolant System (RCS):

Train 1: Control cable: CV-951
CV-953
CV-955
Instrumentation cable: TE-2421A
Train 2: Instrumentation cable: TE-3042A

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-B, sheet 3.

FIRE AREA/ZONE 1-TB-35-9B

Effects of Fire on Hot Standby Capability

120V — Damage to cabling for vital bus 5 resulting in the loss of power to steam generator level instrumentation, RCS instrumentation and AFW valves may occur. Operator action will be taken to isolate instrument air and manually position auxiliary feedwater flow control valves. Redundant steam generator level transmitters will remain available in the control room. Control room delta T instruments or dedicated shutdown panel hot leg instruments will remain available for hot leg temperature indication.

RCS — Damage to circuits associated with pressurizer pressure transmitter may occur. Cables for dedicated shutdown panel pressurizer pressure indication are located outside this fire zone and will remain available.

Damage to cabling for the train 2 pressurizer pressure transmitter could cause spurious operation of pressurizer heater groups A and B, and pressurizer spray control valves. Spurious operation of pressurizer heater groups A and B can be prevented by tripping the heaters from the control room. Pressurizer heater groups C and D will remain available. Spurious operation of pressurizer spray control valves will not affect safe shutdown as the reactor coolant pumps are tripped.

Damage to cabling for pressurizer transmitter could result in spurious operation of PORV. No mitigation is required as cables for the PORV block valve are located outside the fire zone and will remain available to isolate this line.

Damage to cabling for RCS temperature indication may occur. No mitigation is required as dedicated shutdown panel instruments will remain available. Cable and equipment for delta T instruments is located outside the fire zone and will provide indication in the control room.

VCC — Damage to cabling for the volume control tank level transmitter could cause spurious operation or trip of the RWST charging isolation valves, volume control tank isolation valve and/or trip the train 2 charging pump. Cables for the train 1 charging pump, the train 1 RWST isolation valve and the RWST charging isolation bypass valve are located outside the fire area and will remain available to provide a charging suction path.

MSS — Damage to cabling for steam generator level transmitters may occur. Cable and equipment for redundant level transmitters are located outside the fire zone and will provide indication in the control room.

Damage to turbine stop valve actuators and turbine stop valves may occur. Operator action will be taken to trip the turbine at the turbine stand.

Effects of Fire on Hot Standby Capability (contd)

AFW — Damage to circuits associated with the motor driven AFW pump may occur and could result in loss of remote control of the pump and its discharge valve. Operator action will be taken to deenergize and manually open the discharge valve and start the pump at 480V switchgear 3.

Damage to auxiliary feedwater flow control valves may occur and could cause loss of remote valve control and cause the valves to spuriously open. Operator action will be taken to isolate instrument air and manually position the flow control valves.

Damage to valves associated with the steam driven AFW pump may occur. No mitigation is required as the motor driven AFW pump will remain available as discussed above.

DG — Damage to cabling for the exciter cabinet for diesel generator 2 and the DG local control panel may occur. No mitigation is required as diesel generator 1 will remain available since its cables and equipment are located outside the fire area.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface

RCS — Damage to the cabling for the reactor vessel vent valves may occur. These valves will fail in their required safe shutdown position.

Damage to the cabling for the pressurizer high point vent valves may occur. Disconnect switches at the penetration area will be used to close the valves. Spurious actuation of the vent valves until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

Consequences of Spurious Operation

AFW — Damage to cabling for AFW Bypass isolation valve may cause spurious operation of the valve. Operator action will be taken to close the valve.

Effects of Fire on Alternate Shutdown Equipment

CCW Damage to control cabling for RCP thermal barrier pump may occur. No mitigation is required as the CCW pumps will remain available since their cabling and equipment are located outside this fire zone.

Effects of Fire on Dedicated Shutdown Equipment

EES Damage to offsite power circuits resulting in loss of remote breaker control and/or spurious tripping of the breaker may occur. This will have no adverse affect on safe shutdown since diesel generator 1 will remain available since its equipment and cables are located outside the fire zone.

PAS Damage to cabling for the reactor coolant inlet isolation valve may occur. The source range neutron flux monitor remains available for determination of shutdown margin since its equipment and cables are located outside this fire zone.

RSS Damage to cabling for the RCP sample isolation valve may occur. Damage to cabling for the PASS reactor coolant Loop C sample valve may also occur. The source range neutron flux monitor remains available for determination of shutdown margin since its equipment and cables are located outside this fire zone.

Conclusion

The ionization smoke detectors in the Turbine Deck high pressure turbine housing provide local coverage for the hazard. The system has been evaluated to provide adequate, early warning of a turbine lube oil fire to the ESO office and control room. Manual fire fighting equipment is provided in the zone and within adjacent areas/zones. The in-situ combustible loading on the turbine deck consists of oil and grease from the turbine lube oil system and the overhead crane. The fire protection features, tortuous path of travel, and low combustible loading are expected to adequately mitigate the consequences of the fire and confine it to the zone under consideration.

The normal safe shutdown equipment credited for a fire in the zone is expected to remain available for shutdown due to fire barriers provided, spacing separation, time intervals for operator actions, and short fire duration in accordance with the requirement of 10CFR50 Appendix R, Section III.G.1. Alternate safe shutdown equipment is also credited for this fire zone. An exemption to the requirements of 10CFR50 Appendix R, Section III.G.3 has been granted for partial detection and lack of suppression.

FIRE AREA/ZONE: 1-TB-10-9C

AREA: 858 sq.ft. **DESCRIPTION:** AFW PIPE TRENCH AND STORAGE TANK

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	0 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	N/A
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 9A, hydrants on fire main
Portable Extinguishers	none, (1) 160B:C in 9A
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC/floor, NR/ceiling
- Fixed Openings	MH/4D,9A,exterior
- Penetrations	NP/4D,9A
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater	3	1,2,3	
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

	3	1,2,3	

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			
SUMMARY			

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :NO
Spurious Operation :NO

FIRE AREA/ZONE 1-TB-10-9C

Location

Turbine Building - El. 10'-0" - AFW Pipe Trench and Storage Tank - 858 square feet - Fig. 8-A, 8-C.

Combustible Material	Quantity
None	Nil

Fire loading - None
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - None

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

A fire is not expected to occur during normal operations. The maximum credible fire is postulated to involve transient combustible materials.

Fire Protection Equipment

No automatic fire fighting or fire detection equipment is provided within the zone. Manual fire fighting equipment is available in adjacent zone 1-TB-8-9A. Hose streams are also available from yard hydrants.

Construction

The auxiliary feedwater storage tank is located outside the vital area, approximately 200 feet south of the turbine building in fire zone 1-YD-14-4K. The walls and floor of the pipe trench are heavy concrete with an approximate thickness of 6 inches. Metal hatches at ground level form the roof of the pipe trench.

Equipment Required for Hot Standby

Auxiliary Feedwater (AFW):

Train 1: Piping
Train 2: Piping
Train 3: Auxiliary Feedwater Storage Tank D-2A
Piping and Valve

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figures 8-A and 8-C, sheet 3.

Effects of Fire on Hot Standby Capability

AFW Damage to the auxiliary feedwater tank or piping is not expected as a result of the design basis fire, as there are no components within the zone which could be adversely affected by a fire.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusion

The manual fire fighting equipment located on the adjacent ground floor of the Turbine Building provides the only fire suppression coverage for this zone. The zone contains a negligible amount of in-situ combustibles and the design basis fire is postulated to involve only transient combustible materials. The extremely low quantity of combustibles provides low fire loading and no observable heat rate. The fire protection features are expected to adequately mitigate the consequences of the fire and confine it to the zone under consideration.

One train of equipment necessary to accomplish safe shutdown is expected to remain available due to the spacing separation and low combustible loading. Normal shutdown equipment is credited for a fire in this zone and the zone complies with the requirements of 10CFR50 Appendix R, Section III.G.

FIRE AREA/ZONE: 1-TB-20-9D

AREA: 2942 sq.ft. **DESCRIPTION:** MAIN TRANSFORMER AREA

COMBUSTIBLES

Oil & Grease	114878 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	120 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	746900 BTU's/sq.ft.
Fire Loading - Max Permissible	746900 BTU's/sq.ft. (SEE TEXT.)
Heat Rate (degrees F)	E/1950
Fire Duration	9.34 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, hydrants on fire main
Portable Extinguishers	none, (1)10A:80B:C & (1) 10B:C in 9A
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	CB/9A
- Floors,Ceiling or Roof	no roof, gravel floor
- Fixed Openings	LV/9A, OP/9A
- Penetrations	C,P, NP/9A, NC/9A
- Doors(UL Class/Zone #)	A/9A

HOT STANDBY SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant		
Volume Control & Charging		2,3
Main Steam		
Auxiliary Feedwater		
Component Cooling Water		
Saltwater Cooling		
Diesel Generator		
Gaseous Nitrogen		
Containment Ventilation		

COLD SHUTDOWN SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal		
Component Cooling Wtr (to RHR)		

ALTERNATE SHUTDOWN SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)		3
Auxiliary Saltwater Cooling		

DEDICATED SHUTDOWN SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant		
West Auxiliary Feedwater		
Post Accident Sampling(PAS/RSS)		

SUMMARY

		3,(3),2

ESSENTIAL ELECTRIC SYSTEMS

EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		
480 V (AC)		
120 V (AC)		
125 V (DC)		
SUMMARY		

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :NO
Spurious Operation :NO

FIRE AREA/ZONE 1-TB-20-9D

Location

Turbine Building - El. 20'-0" - Main Transformer Area - 2942 square feet - Fig. 8-A.

Combustible Material	Quantity
Oil	15358 gal.
Plastic	120 lbs.

Fire loading - 746,900 Btu/sq ft
Maximum permissible fire loading - 746,900 Btu/sq ft
Heat Rate - E/1950°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The combustible loading is acceptable based on the open air configuration which would readily dissipate the heat and products of combustion of a fire in the area. Based on this configuration, and the low probability of a transformer fire affecting more than one transformer, a fire in the area will be contained by the concrete block walls forming the boundary to fire area 1-TB-8-9A.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1950°F and would involve transformer oil and plastics.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No fire fighting equipment is available within the zone. Hose stations are available in adjacent zone (1-TB-9-9A). Fire hydrants are also located on the fire main on the south and east sides of this fire zone.

Construction

This zone is located at the southeast section of the Turbine Building at grade level. The zone is open to zone 1-YD-14-4J on the south and east sides. The north and west sides are adjacent to fire zone 1-TB-9-9A. The north boundary is concrete block construction and chain link fence. The west wall is concrete block. There is no ceiling or roof to this zone. An 8" high curb is constructed around the transformers in the zone.

One 3-hour rated fire door allows access to the exciter area (1-TB-9-9A). Two louvered openings and screened vents are located on the west wall. A 6" gap flashed with sheet metal runs along the entire length of the west wall and along the north wall up to the chain link fence. This gap is located between the top of the conrete block wall and the bottom of the concrete pad of the turbine and heater decks.

Equipment Required for Hot Standby

Volume Control and Charging (VCC):

Train 3:	Control cable:	RWST Isolation Valve MOV-883
Train 2:	Control cable:	RWST Charging Isolation Valve MOV-1100D

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

Safety Injection (SIS):

Train 3:	Power cable:	Safety Injection Discharge Valve MOV-850C
	Control cable:	MOV-850C

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figure 8-A sheet 3.

Effects of Fire on Hot Standby Capability

VCC Damage to cabling for RWST isolation valve may occur. The valve will fail as is, in the normally open position, as required for safe shutdown.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

SIS Damage to cabling for safety injection Loop C discharge valve may occur. Use of this equipment is not credited for shutdown in this fire zone.

Effect of Fire on Dedicated Shutdown Equipment

None

Conclusion

The hose stations in the adjacent ground floor of the turbine building, (1-TB-8-9A) and the yard hydrants within the area provide fire suppression capability for the fire associated with the hazard. The zone is also readily accessible by mobile fire fighting apparatus capable of discharging a combined flow of 2500 gpm to a potential fire. Ionization and infrared detectors located at the south end of 1-TB-8-9A are expected to detect fire and smoke propagation to adjacent zone 1-TB-8-9A. These detectors activate the water spray system installed over the hydrogen seal oil unit, and alert the ESO office and control room. An 8" high curb is constructed around the zone and prevents the spread of a running liquid transformer oil fire by containing it within the zone. Since the zone does not have a roof, the heat and products of combustion produced by a fire in this zone will be released to the atmosphere reducing the possibility of fire propagation into adjacent fire zones. Additionally, a fire would have to take a torturous path through penetrations on the north or west walls of the fire zone, into 1-TB-8-9A, and propagate through the turbine building over 120 feet via cable trays. The fire protection features, discussed above, will adequately mitigate the consequences of the fire and confine it to the fire zone under consideration.

Normal shutdown equipment is credited for a fire in this zone. The safe shutdown equipment credited for a fire in this zone has been evaluated to remain available for operation due to the confinement of a transformer oil fire by curbing and the spacing separation. An exemption to the requirements of 10CFR50 Appendix R, Section III.G.2.b has been granted for lack of suppression and detection.

FIRE AREA/ZONE: 1-TB-14-9E

AREA: 2933 sq.ft. **DESCRIPTION:** RAMP AREA

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	192 lbs.
Class A	30 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	918 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	E/250
Fire Duration	0.01 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	in adjacent zones
Portable Extinguishers	none, (1)3A:80B:C, (2)10B:C in 8, #
Detectors (Type)	in adjacent zones

FIRE RESISTANCE RATING

- Walls	NR/4J,9A, 3HR/8, HC/13A,11A,26
- Floors,Ceiling or Roof	HC/floor,no roof
- Fixed Openings	OP/4J
- Penetrations	C/8, NC/94, ND/13A, QD/8
- Doors(UL Class/Zone #)	NR/8

HOT STANDBY SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant		1
Volume Control & Charging		3,2
Main Steam		
Auxiliary Feedwater		
Component Cooling Water		(1)
Saltwater Cooling		
Diesel Generator		
Gaseous Nitrogen		
Containment Ventilation		

COLD SHUTDOWN SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal		
Component Cooling Wtr (to RHR)		

ALTERNATE SHUTDOWN SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)		3
Auxiliary Saltwater Cooling		

DEDICATED SHUTDOWN SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant		
West Auxiliary Feedwater		
Post Accident Sampling(PAS/RSS)		

SUMMARY

		1,3,(1,3),2

ESSENTIAL ELECTRIC SYSTEMS

EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		
480 V (AC)		
120 V (AC)	1	
125 V (DC)	1	
SUMMARY	1	

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :NO
Spurious Operation :NO

NOTES

- (1)4A:40B:C, (1)2A:40B:C in 12

FIRE AREA/ZONE 1-TB-14-9E

Location

Ramp - El. 14'-0" - East side of Turbine Building 2933 square feet - Fig. 8-A

Combustible Material	Quantity
Cable insulation	192 lbs.
Class A combustibles	30 lbs.

Fire Loading: 918 Btu/sq ft
Maximum permissible fire loading: 13,000 Btu/sq ft
Heat rate: E/250°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 250°F and would involve cable insulation and class A combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic fire fighting or detection equipment is provided in this zone. Portable fire extinguishers, hose reels, and yard hydrants are available in adjacent fire areas/zones.

Construction

This fire zone is separated from area 1-PB-14-8 by a 3-hour rated wall and from zone 1-PB-20-11A and 1-PB-20-13A by a non-rated reinforced concrete wall 8" in thickness. The east wall a portion of the west wall adjoining area 1-PB-14-26 is reinforced concrete construction. The remaining west wall adjoining the 1-TB-14-9A is chain link fence. The zone is open to 1-YD-14-4J on the south and does not have a roof or ceiling covering the entire zone. A non-rated door provides communication to area 1-PB-14-8.

The installation of a 3 hour damper (identified as non-rated in the matrix) in the wall communicating with fire zone 1-PB-14-8 does not meet the manufacturer's installation requirements. An evaluation of the fire protection systems provided in the area, the combustible loading, the construction of the dampers, and the location of combustibles and safe shutdown circuitry in the vicinity of the dampers has been conducted to document the adequacy of the existing configuration.

Equipment Required for Hot Standby

Essential Electrical System (EES):

120V(AC):	Train 1:	Power cable:	Inverter 4
125V(DC):	Train 1:	Power cable:	Battery Charger B (D03)
		Control cable:	D03

Reactor Coolant System (RCS):

Train 1:	Power cable:	RPS Trip Circuits

Volume Control and Charging (VCC):

Train 3:	Control cable:	RWST Isolation Valve MOV-883
Train 2:	Control cable:	RWST Charging Isolation Valve MOV-1100D

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

Safety Injection System (SIS):

Train 3:	Power cable:	Safety Injection Loop C Discharge Valve MOV-850C
	Control cable:	MOV-850C

Component Cooling Water (CCW):

Train 1:	Power cable:	RCP Thermal Barrier Pump G-964
	Control cable:	G-964

Dedicated Shutdown Equipment

Essential Electrical System (EES):

220 kV:	Control cable:	Offsite Power Circuit Breaker:
		Pos 1 PCB #1
		Pos 1 PCB #2
		Pos 3 PCB #5
		Pos 3 PCB #6

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barrier

For area/zone barriers requiring surveillance, refer to Figure 8-A, Sheet 3.

Effect of Fire on Hot Standby Capability

EES Damage to cabling for Train 1 120V electrical system may occur. Back-up power to vital bus will remain available from MCC-2.

Damage to cabling for 125V electrical system may occur. Cabling for the train 2 125V system are located outside this fire zone and will remain available.

RCS Damage to power to RPS trip circuits may occur. This will not affect safe shutdown since the trip circuits are fail safe.

VCC Damage to cabling for RWST isolation valve may occur. The valve will fail as is, in the normally open position, as required for safe shutdown.

Effect of Fire on Cold Shutdown Capability

None

Effect of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effect of Fire on Alternate Shutdown Equipment

CCW Damage to control cabling for RCP thermal barrier pump may occur. CCW pumps will remain available.

SIS Damage to cabling for safety injection loop C discharge valve may occur. This valve is not credited for shutdown in this fire zone.

Effect of Fire on Dedicated Shutdown Equipment

EES Damage to offsite power cabling may occur. This will have no adverse impact upon safe shutdown capability since the emergency diesel generator system will remain available.

Conclusion

The portable fire extinguishers and hose reels available in the adjacent fire area/zones provide fire suppression capability for this fire zone. There is no roof over more than half of the zone, so the heat and products of combustion produced from a fire would rapidly dissipate into the atmosphere.

Normal shutdown equipment is credited for a fire in this zone. The equipment credited for safe shutdown has been evaluated to remain available for safe shutdown due to the open air boundaries of the zone and the spacing separation. An exemption from the requirements of 10CFR50 Appendix R, Section III.G.2.b has been granted for lack of suppression and detection.

FIRE AREA/ZONE: 1-TB-14-10

AREA: 87 sq.ft. **DESCRIPTION:** LUBE OIL STORAGE SHED

COMBUSTIBLES

Oil & Grease	3716 lbs.
Cable (30% Fill)	0 lbs.
Class A	82 lbs.
Charcoal	0 lbs.
Plastics	7 lbs.
Miscellaneous	5 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	788955 BTU's/sq.ft.
Fire Loading - Max Permissible	800000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1950
Fire Duration	9.86 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 9A
Portable Extinguishers	none, (1)10A:60B:C in 9A
Detectors (Type)	infrared

FIRE RESISTANCE RATING

- Walls	3hr
- Floors,Ceiling or Roof	3hr/roof, HC/floor
- Fixed Openings	none
- Penetrations	C
- Doors(UL Class/Zone #)	A/9A

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :NO
Spurious Operation :NO

UNIT 1 POWER BLOCK

The Unit 1 Power Block is a reinforced concrete and concrete block structure which contains the control room complex, the 4160V switchgear room, battery room 1, and offices. The power block is divided into thirteen (13) fire areas.

The Power Block contains components and/or cabling for the following systems, which can be used to achieve, maintain, or support safe shutdown:

- Reactor Coolant
- Volume Control and Charging
- Main Steam
- Auxiliary Feedwater
- Residual Heat Removal
- Component Cooling Water
- Saltwater Cooling
- Diesel Generator Systems
- Gaseous Nitrogen
- Containment Ventilation
- Safety Injection
- Main Feedwater
- Post Accident Sampling
- Reactor Cycle Sampling
- Essential Electric Systems

The types of fire protection/detection equipment available in or near this building consists of the following:

- Portable extinguishers.
- Manual hose stations.
- Ionization smoke stations.
- Manual water spray.
- Total flooding Halon 1301 suppression system.

Fire Area/Zone	Contains Safe Shutdown Equipment	Contains Safety Related Equipment Not Required for Safe Shutdown	Page No.	Figure No.
1-PB-14-8	Yes	Yes	1-PB-1	8-A
1-PB-20-11A	Yes	Yes	1/PB-22	8-A
1-PB-32-11B	No	Yes	1/PB-28	8-B
1-PB-30-11C	No	No	1/PB-32	8-B
1-PB-30-11D	Yes	No	1/PB-33	8-B
1-PB-30-11E	No	No	1/PB-37	8-B
1-PB-20-12	Yes	Yes	1/PB-38	8-A
1-PB-20-13A	Yes	Yes	1/PB-44	8-A
1-PB-20-13B	Yes	No	1/PB-50	8-A
1-PB-29-13C	Yes	Yes	1/PB-54	8-A
1-PB-32-14	No	No	1/PB-59	8-B
1-PB-35-15	No	No	1/PB-60	8-B
1-PB-42-16	Yes	Yes	1/PB-61	8-A
1-PB-14-25	Yes	No	1/PB-81	8-A
1-PB-14-26	Yes	No	1/PB-86	8-A
1-PB-20-29	No	No	1/PB-90	8-A, 8-B
1-PB-42-30A	Yes	No	1/PB-91	8-B
1-PB-42-30B	No	No	1/PB-95	8-B
1-PB-42-31A	No	No	1/PB-96	8-B
1-PB-20-31B	No	No	1/PB-97	8-A, 8-B
1-PB-56-33	Yes	No	1/PB-98	8-B

FIRE AREA/ZONE: 1-PB-14-8

AREA: 2816 sq.ft. **DESCRIPTION:** 4160V SWITCHGEAR ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	36864 lbs.
Class A	160 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	168018 BTU's/sq.ft.
Fire Loading - Max Permissible	240000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1850
Fire Duration	2.10 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	Halon
Hose Stations	none, (2) in 9A, (1) in 11A
Portable Extinguishers	(1)3A:80B:C,(2)10B:C,(1)2A:40B:C,(1)8B:C
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr
- Floors,Ceiling or Roof	HC/floor, 3hr/ceiling
- Fixed Openings	none
- Penetrations	P,D,C, QD/9E
- Doors(UL Class/Zone #)	A/25,26,9A, L/9E

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			1,2,(1)
Volume Control & Charging			1,2,3,1*
Main Steam			1,2(1)
Auxiliary Feedwater			1,2
Component Cooling Water			1,2
Saltwater Cooling			1,2
Diesel Generator			1,2
Gaseous Nitrogen			2
Containment Ventilation			1,2

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			1,2
Component Cooling Wtr (to RHR)			1

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			1,2,3
Auxiliary Saltwater Cooling			2

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			1

SUMMARY

			1,2,3(123),1*

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)	1,2	1,2	
480 V (AC)		1	1
120 V (AC)	1,2	1,2	
125 V (DC)		1	
SUMMARY	1,2	1,2	1

SHUTDOWN SYSTEM CREDITED :Dedicated

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :Yes(SEE TEXT)
Spurious Operation :Yes(SEE TEXT)

FIRE AREA/ZONE 1-PB-14-8

Location

Power Block - El. 14'-0" - 4160V Switchgear Room - 2816 square feet - Fig. 8-A.

Combustible Material	Quantity
Cable insulation	36,864 lbs
Class A combustibles	160 lbs
Fire loading -	168,018 Btu/sq ft
Maximum permissible fire loading -	240,000 Btu/sq ft
Heat Rate - E/1850 °F	

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1850 °F and would involve cable insulation and Class A combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

The area contains an automatic total flooding Halon 1301 suppression system actuated by the alarm of at least two cross-zoned ionization smoke detectors or by local manual control. The system consists of a sufficient quantity of Halon 1301 for two applications. Fire doors and dampers are interlocked to automatically close upon actuation of the first smoke detector. Actuation of any ionization detector results in local, ESO office, and control room alarm. Manual fire fighting equipment is available within the area and in adjacent zones 1-TB-8-9A and 1-PB-20-11A.

Construction

The walls and ceiling of the area are three hour rated. The floor is a reinforced concrete base slab. Structural steel in the area is embedded in concrete or protected by fireproofing. 3 hour rated doors separate the area from the turbine building ground floor (1-TB-8-9A), the west cable shaft (1-PB-14-25), and the east cable shaft (1-PB-14-26). A non-rated bullet proof door communicates with the ramp (1-TB-14-9E). Ventilation penetrations are provided with 3 hour rated fire dampers.

The installation of a 3 hour damper (identified as non-rated in the matrix) in the wall communicating with fire zone 1-TB-14-9E does not meet the manufacturer's installation requirements. An evaluation of the fire protection systems provided

Construction (contd)

in the area, the combustible loading, the construction of the dampers, and the location of combustibles and safe shutdown circuitry in the vicinity of the dampers has been conducted to document the adequacy of the existing configuration.

Equipment Required for Hot Standby

Essential Electric System (EES):

4160V(AC):	Train 1:	Bus 1C Power cable: Bus 1C Control cable: Bus 1C
	Train 2:	Bus 2C Power cable: Bus 2C Control cable: Bus 2C
480V(AC):	Train 1:	Switchgear 1 MCC 1 MCC 1A Power cable: Switchgear 1 MCC 1 MCC 1A Power cable: MCC 3B Control cable: Switchgear 1 & 3
120V(AC):	Train 1:	Inverter 4 Power cable: Vital Bus 1 (Y-11) 2 (Y-12) 3 (Y-13) 3A(Y-33) Regulated Bus 1 (Y-11R) 2 (Y-12R) 3 (Y-13R) Inverter 4
	Train 2:	7.5/37.5 kVA Transformer Power cable: 7.5/37.5 kVA Transformer Utility Bus (Y-15) Regulated Bus 4 (Y-14R)
125V(DC):	Train 1:	Power cable: Battery Charger A (D02) Inverter 4, Battery Charger B (D03) Control cable: D02, D03

Equipment Required for Hot Standby (contd)

Reactor Coolant System (RCS):

Train 1: Power cable: RPS Trip Circuits
Pressurizer Heater Group A & C
Pressurizer Level LT-431
Cold Leg Temperature TE-411B
Control cable: RPS Trip Circuits
Block Valve: CV-530
CV-531
PORV CV-545
CV-546
Pressurizer Heater Group A & C
Instrumentation cable: NE-1201
NE 1202
LT-431
Pressurizer Pressure
PT-430
PT-431
Cold Leg Temperature
TE-402C
TE-3412C
TE-422C

Train 2: Power cable: Pressurizer Level LT-435
Pressurizer Pressure PT-425
Control cable: Pressurizer Heater
Group B & D
Instrumentation cable: LT-435
PT-425

Volume Control and Charging (VCC):

Train 1: Power cable: Pump G-8B
Pump G-943
Charging Flow Control
Valve FCV-1112
RWST Charging Isolation
Valve MOV-1110B
Cooling Fan MG-8BF
MOV-1100E

Equipment Required for Hot Standby (contd)

Volume Control and Charging (VCC):

Train 1: Control cable: G-8B
G-943
MG-8BF
FCV-1112
MOV-1100B
MOV-1100E
Instrumentation cable: FT-1112

Train 2: Power cable: Pump G-8A
Seal Injection Flow Valve
FCV-1115A
FCV-1115B
FCV-1115C
RCP Sealwater Return Control
Valve PCV-1115A
PCV-1115B
PCV-1115C
Control cable: G-8A
Pump G-942
Cooling Fan MG-8AF
FCV-1115A
FCV-1115B
FCV-1115C
PCV-1115A
PCV-1115B
PCV-1115C
Volume Control Tank
Isolation Valve MOV-1100C
Instrumentation cable: RCP Seal Flow
Pressure Controller
PC-1115A
PC-1115B
PC-1115C
RCP Seal Return
Flow Pressure
PI-1115A
PI-1115B
PI-1115C
PT-1115A
PT-1115B
PT-1115C

Equipment Required for Hot Standby (contd)

Volume Control and Charging (VCC):

Train 3: Control cable: RWST Isolation Return Valve MOV-883

Train 2: Control cable: RWST Charging Isolation Valve MOV-1100D

Main Steam (MSS): PV-1611

Train 1: Power cable: Turbine Stop Valve Actuator PV-1612
S/G Blowdown Control Valve CV-100/100B
Control cable: PV-1611
PV-1612
CV-100/100B
Atmospheric Steam Dump Valve CV-76(SV-85)
CV-77(SV-86)
CV-78(SV-87)
CV-79(SV-88)

Train 2: Power cable: Atmospheric Steam Dump Air Controller PC-418A
Control cable: PC-418A
Instrumentation cable: Main Steam Pressure PT-459

Train 2: Control cable: Reheater Isolation Valve MOV-14
MOV-15
MOV-16
MOV-17

Auxiliary Feedwater (AFW):

Train 1: Power cable: Pump G-10S
Discharge Valve MOV-1202
Control cable: G-10S
MOV-1202

Train 2: Power Cable: Pump G-10 W
Control Cable: Pump G-10 W
Pump disch valve SV-3110

Equipment Required for Hot Standby (contd)

Component Cooling Water (CCW):

Train 1: Power cable: Pump G-15A
Heat Exchanger Outlet Valve MOV-720B
Control cable: G-15A
MOV-720B
Train 2: Control cable: Pump G-15B
Heat Exchanger Outlet Valve MOV-720A
Control cable: Pump G-15C

Saltwater Cooling (SWC):

Train 1: Power cable: Pump G-13A
Control cable: G-13A
Train 2: Control cable: Pump G-13B

Containment Ventilation (CVS):

Train 1: Power cable: Reactor Cavity Cooling Fan A-9
Control cable: A-9
Control Damper PO-11
Train 2: Control cable: Reactor Cavity Cooling Fan A-9S

Diesel Generator System (DG):

Train 1: Power cable: Standby Fuel Oil Pump G-76
Exciter Cabinet E08
Control cable: G-76
Control Panel C-48
Transfer Pump G-74A
G-74B
E08
Starting Air Pressure Switch PSL-180
PSL-181
Train 2: Control cable: Starting Air Pressure Switch PSL-215
PSL-221
Control Panel C-40
Standby Fuel Oil Pump G-62
Fuel Oil Transfer Pump G-75A
G-75B
Exciter Cabinet E09

Equipment Required for Hot Standby (contd)

Gaseous Nitrogen (GNI):

Train 2: Power cable: PORV Nitrogen Supply Control Valve CV-532
Control cable: CV-532

Equipment Required for Cold Shutdown

Residual Heat Removal (RHR):

Train 1: Power cable: Pump G-14A
Inlet Isolation Valve MOV-813
Heat Exchanger Inlet Valve MOV-822A
Discharge Isolation Valve MOV-833
Flow Control Valve HCV-602
Discharge Temperature: TE-601A TE-601B

Control cable: G-14A
MOV-813
MOV-822A
MOV-833
HVC-602

Instrumentation cable: RHR Inlet Temperature TE-600 TE-601A TE-601B

Train 2: Control cable: Pump G-14B
Inlet Isolation Valve MOV-814
Heat Exchanger Inlet Valve MOV-822B
Discharge Isolation Valve MOV-834

Component Cooling Water (CCW):

Train 1: Control cable: Flow control to E-21A TCV-601A
Flow control to E-21B TCV-601B

High/Low Pressure Interface Equipment

Reactor Coolant System (RCS):

Train 1:	Power cable:	Reactor Vessel Vent Valve SV-2401	
			SV-2402
		Pressurizer High Point Vent Valve SV-2403	
			SV-2404
	Control cable:	SV-2401	
		SV-2402	
		SV-2403	
		SV-2404	

Volume Control and Charging (VCC):

Train 1:	Power cable:	Seal Water Return Isolation Valve CV-527	
		Letdown Containment Isolation Valve CV-525	
	Control cable:	CV-525	
		CV-527	
Train 2:	Power cable:	Seal Water Return Isolation Valve CV-528	
		Letdown Containment Isolation Valve CV-526	
	Control cable:	CV-526	
		CV-528	

Spurious Operation Equipment

Essential Electrical Systems (EES):

120V (AC): Train 2: Power cable: Letdown Valve Power Supply C09

Reactor Coolant System (RCS):

Train 1:	Control cable:	Reactor Coolant Pump G-2A	
			G-2C
		Pressurizer Spray Valve PCV-430C	
		PCV-430H	
Train 2:	Control cable:	Reactor Coolant Pump G-2B	

Volume Control and Charging (VCC):

Train 1:	Control cable:	Letdown Containment Isolation Valve CV-525

Spurious Operation Equipment (contd)

Volume Control and Charging (VCC):

Train 2:

Power cable:
- Primary Water Makeup Control Valve FCV-1102A
- Boric Acid Pump Discharge Valve FCV-1102B
- Sealwater Supply Valve FCV-1115D
- Sealwater Supply Valve FCV-1115E
- Sealwater Supply Valve FCV-1115F
- Low Pressure Letdown Valve PCV-1105

Control cable:
- FCV-1102A
- FCV-1102B
- FCV-1115D
- FCV-1115E
- FCV-1115F
- PCV-1105
- Letdown Orifice Isolation Valve CV-202
- Letdown Orifice Isolation Valve CV-203
- Letdown Orifice Isolation Valve CV-204
- RCS Excess Letdown to RHR Isolation Valve CV-414
- Letdown Flow to Radwaste Valve LCV-1100A
- Letdown Isolation Valve LCV-1112
- Demineralizer Bypass Valve TCV-1105
- Test pump G-42
- Boric Acid Supply Control Valve CV-334
- Letdown Containment Isolation Valve CV-526
- Chemical Blending Control Valve CV-406A
- Chemical Blending Control Valve CV-406B

Spurious Operation Equipment (contd)

Main Steam (MSS):

Train 1:	Control cable:	Condenser Steam Dump Solenoid	SV-89
			SV-90
		S/G Sample Isolation Valves	SV-119
			SV-120
			SV-121
			SV-122
			SV-123
			SV-124

Auxiliary Feedwater (AFW):

Train 1:	Power cable:	Bypass Isolation Valve MOV-1204
	Control cable:	MOV-1204

Containment Spray and Recirculation (CRS):

Train 1:	Control cable:	Refueling Water Pump G-27N
		Containment Spray Control Valve CV-82
		Containment Spray Isolation Valve CV-114
Train 2:	Control cable:	Refueling Water Pump G-27S

Safety Injection (SIS):

Train 1:	Control cable:	Recirculation Valve MOV-356
Train 2:	Control cable:	Recirculation Valve MOV-357
Train 3:	Control cable:	Recirculation Valve MOV-358

Alternate Shutdown Equipment

Reactor Coolant Systems (RCS):

Train 1: Power cable: RCS Delta T TE-400A
TE-400C
Instrumentation cable: Delta T TE-400A
TE-2400C
TE-410A
TE-412C
TE-420A
TE-420C

Component Cooling Water (CCW):

Train 1: Control cable: Thermal Barrier Pump G-964
Thermal Barrier Coil
Return Valve CV-722A
CV-722B
CV-722C

Saltwater Cooling (SWC):

Train 2: Control cable: Auxiliary Pump G-13C

Safety Injection (SIS):

Train 1: Power cable: Pump G-50B
Discharge Valve MOV-850B
Control cable: G-50B
MOV-850B
Return Valve Solenoid SV-528
Feed Valve Solenoid SV-530
Safety Injection Return Valve HV-851B
Safety Injection Feed Valve HV-853B

Train 2: Power cable: Pump G-50A
Discharge Valve MOV-850A
Control cable: G-50A
MOV-850A
Return Valve Solenoid SV-524
Feed Valve Solenoid SV-526
Safety Inlet Valve HV-851A
Safety Injection Feed Valve HV-853A

Train 3: Power cable: Discharge Valve MOV-850C
Control cable: MOV-850C

Alternate Shutdown Equipment (contd)

Main Feedwater (FWS):

Train 1: Power cable: Main Feedwater Pump G-3B
Lube Oil Cooler Fan A-17B
Control cable: G-3B
A-17B
Outlet Isolation Valve
HV-852B (SV-529)
Inlet Isolation Valve
HV-854B (SV-531)

Train 2: Power cable: Main Feedwater Pump G-3A
Control cable: G-3A
Lube Oil Cooler Fan A-17A
Condenser Isolation CV-36
CV-37
Refueling Water Storage Isolation CV-875A
CV-875B
Outlet Isolation Valve HV-852A (SV-525)
Inlet Isolation Valve HV-854A (SV-527)

Dedicated Shutdown Equipment

Reactor Cycle Sampling System (RSS):

Train 1: Power Cable: PASS Reactor Coolant Sample Valve CV-956

Safety Related Equipment Not Required for Safe Shutdown

Reactor Coolant System (RCS):

Train 1: Control cable: CV-951
CV-953
CV-955

Safety Injection (SIS):

Train 1: Power cable: Lube Oil Cooler G-17B
Instrumentation cable: FT-912
Train 2: Instrumentation cable: FT-913
Train 3: Instrumentation cable: FT-914

Volume Control and Charging (VCC):

Train 2: Power Cable: CV-304
CV-305
Control cables: CV-304
CV-305

Safety Related Equipment Not Required for Safe Shutdown (contd)

Main Feedwater (FWS):

Train 1:	Power cable:	Pump	G-1C
			G-1D
	Control cable:	G-1C	
		G-1D	
		MOV-20	
		FCV-456	
		FCV-457	
		FCV-458	
	Instrumentation cable:		FT-456
			FT-457
			FT-458
Train 2:	Power cable:	Pump	G-1A
			G-1B
			MOV-21
	Power cable:	LT-453	
		LT-454	
		LT-455	
	Control cable:	MOV-22	
	Instrumentation cable:		LT-453
			LT-454
			LT-455

Instrument Air (ISA):

Train 1:	Power cable:	Compressor K-1A
	Control cable:	Compressor K-1A
Train 2:	Control cable:	Compressor K-1B
Train 3:	Control cable:	Compressor K-1C

Main Steam (MSS):

Train 1:	Power cable:	FT-460	
		FT-461	
		FT-462	
	Instrumentation cable:		FT-460
			FT-461
			FT-462

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effect of Fire on Hot Standby Capability

ESS Damage to Train 1 and 2 4160V and portions of Train 1 and 2 480V essential electrical systems may occur. Operator action to trip offsite power will be taken prior to exiting the control room. The dedicated shutdown system will be utilized for a fire in this area.

Effects of Fire on Hot Standby Capability (contd)

Damage to portions of Train 1 and 2 120V essential electric systems may occur. The dedicated shutdown system will remain available.

Damage to cabling for Train 1 125V electrical system may occur. The dedicated shutdown system will remain available.

RCS Damage to reactor trip circuits may occur. This will result in a reactor trip since the system is fail safe.

Damage to control cabling for the PORVs and associated block valves may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. The PORVs will fail closed on loss of power. Cables for dedicated shutdown operation of PORV are located outside the fire area and will remain available. Spurious actuation of the PORVs, until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

Damage to cabling for pressurizer heater groups A, B, C, and D may occur. Operator action will be taken to transfer control of the required portion of pressurizer heater group D to the dedicated shutdown panel. Cables for dedicated shutdown system operation of pressurizer heater group D are located outside this fire area and will remain available.

Damage to cabling for RCS pressurizer level and pressurizer pressure transmitters may occur. Instrumentation will remain available at the dedicated shutdown panel. Spurious operation of the spray valves as a result of spurious pressurizer pressure signals will not affect safe shutdown as the reactor coolant pumps are tripped. Pressurizer code safety valves will be available for over-pressure protection. PORVs will be available for system pressure control after dedicated shutdown system operation is initiated.

Damage to cabling for RCS cold leg temperature may occur. Cold leg temperature indication will remain available at the dedicated shutdown panel.

VCC Damage to cabling for charging pumps may occur. Operator action will be taken to transfer control of the train 2 pump to the dedicated shutdown panel. Cables for dedicated shutdown operation are located outside this fire area and will remain available. Cables for train 2 charging pump breaker control and VCT low level interlock are protected with 1 hour wrap to ensure the ability to trip the pump on low VCT level, to prevent cavitation, remains available. Interruption of seal injection and seal cooling to the reactor coolant pump seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

Damage to cabling for lube oil cooling pumps and associated cooling fans may occur. Operator action will be taken to transfer control of the train 2 equipment to the dedicated shutdown panel. Cable for the dedicated shutdown system operation is routed outside this fire area and will remain available.

Effects of Fire on Hot Standby Capability (contd)

Damage to charging loop A control valve may occur. Operator action will be taken to close the charging flow control valve from the dedicated shutdown panel.

Damage to cabling for charging flow control valve may occur. Operator action will be taken to position the valve from the dedicated shutdown panel as required. The equipment/cables required for dedicated shutdown operation are located outside this fire area and will remain available.

Damage to cabling for seal injection flow valves and RCP sealwater return control valves may occur. Operator action will be taken to deenergize power to the seal water return control valves which fail open, fail open the seal injection flow valves, verify seal water supply valves closed, and control seal injection flow using manual valves located upstream of the charging flow control valve. These actions will also mitigate the consequences of damage to cabling for RCP seal pressure instruments. Interruption of seal injection and seal cooling to the reactor coolant pump seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

Damage to RWST isolation return valve may occur. The RWST isolation return valve will fail as is, in its normally open position, as required for safe shutdown. The RWST charging isolation bypass valve will remain available to provide a charging path from the RWST.

Damage to cabling for the volume control tank isolation valve may cause spurious operation of the valve. If the valve spuriously closes, an automatic bypass around the RWST charging isolation valves will preclude loss of charging pump suction flow path. If the valve spuriously remains open, with a loss of letdown, a low level signal from the volume control tank will trip the train 2 charging pump. Operator action will be taken to manually close the volume control tank isolation valve.

MSS Damage to cabling for atmospheric steam dump valves, associated air controller and main steam pressure transmitter may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious actuation of the steam dump valves until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

Damage to cabling for reheater isolation valves may occur. Operator action will be taken to manually close the valves. Spurious actuation of these valves until the operator action is performed, has been evaluated and determined to be acceptable.

Effects of Fire on Hot Standby Capability (contd)

Damage to cabling for the turbine stop valve actuators may occur. Operator action will be taken to trip the turbine at the turbine stand. Spurious operation of these valves until operator action is taken to manually trip the turbine, has been evaluated and determined to be acceptable.

Damage to cabling for steam generator blowdown control valves may occur. Operator action will be taken to close manual valves upstream. Spurious actuation of the blowdown valves, until operator action is taken to close the blowdown valves upstream has been evaluated and determined to be acceptable.

AFW Damage to cabling for motor driven auxiliary feedwater pumps and associated valves may occur. The west (dedicated) auxiliary feedwater pump will remain available. Loss of auxiliary feedwater flow until operator action is taken to initiate auxiliary feedwater flow from the dedicated shutdown system, has been evaluated and determined to be acceptable.

CCW Damage to cabling for Trains 1 and 2 CCW pumps and heat exchanger outlet valves may occur. Component cooling water is not required to support dedicated shutdown system operation. Interruption of seal cooling and seal injection to the reactor coolant pump seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

SWC Damage to cabling for saltwater cooling pumps may occur. The saltwater cooling system is not required to support dedicated shutdown system operation.

CVS Damage to cabling for reactor cavity cooling fans and associated damper controls may occur. The fans are required only to support operation of the source range monitors. During dedicated shutdown system operation, shutdown margin will be determined by sampling primary system boron concentration.

DG Damage to cabling for diesel local control panels may occur. Operator action will be taken to trip diesel generators 1 and 2. The dedicated shutdown system will remain available.

Damage to cabling for standby pumps, transfer pumps, exciter cabinets and starting air pressure switches for the diesel generators may occur. The dedicated shutdown system will remain available.

GNI Damage to cabling for PORV nitrogen supply control valve may occur. Operator action will be taken to open the manual bypass for to supply nitrogen for the operation of the PORV and block valves from the dedicated shutdown panel.

Effect of Fire on Cold Shutdown Capability

RHR Damage to cabling for RHR pumps and associated valves may occur. Cables and equipment for the west (dedicated) auxiliary feedwater pump are located outside the fire area and will remain available for single phase cooldown.

CCW Damage to cabling for CCW flow control to RHR heat exchangers may occur. CCW and RHR system operation is not required for dedicated shutdown system operation.

High/Low Pressure Interface

RCS Damage to cabling for reactor vessel and pressurizer high point vent valves may cause spurious operation. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Vent valves will fail closed on loss of power. Spurious actuation of the vent valves, until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

VCC Damage to cabling for Train 1 and 2 letdown containment isolation valves, and seal water return isolation valves may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. The valves will fail closed on loss of power. Spurious actuation of the seal return and letdown valves, until operator action is taken to deenergize and close the valves, has been evaluated and determined to be acceptable.

Consequences of Spurious Operation

EES Damage to cabling for letdown valve power supply may cause loss of remote valve control. Charging path via RWST will remain available.

RCS Damage to cabling for reactor coolant pumps G-2A, G-2B and G-2C may cause spurious operation of the pumps. Turbine trip will deenergize the pumps.

Damage to cabling for pressurizer spray valves may cause spurious operation of the valves. This will not impact safe shutdown since the RCPs will be tripped.

VCC Damage to cabling for letdown containment isolation valves may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. The valves fail closed on loss of power. Spurious actuation of these valves, until operator action is taken to deenergize and close the valve, has been evaluated and determined to be acceptable.

Consequences of Spurious Operation (contd)

Damage to cabling for charging system test pump may cause spurious operation of the pump. Operator action will be taken to trip offsite/diesel generator power to deenergize this pump.

Damage to cabling for sealwater supply valves may cause spurious operation of the valves. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. The valves fail closed on loss of power.

Damage to cabling for the letdown valves may cause spurious operation. Charging path via RWST will remain available.

Damage to cabling for primary water makeup control valve, boric acid pump discharge valve, letdown demineralizer control valve and chemical blending control valve may cause spurious operation of the valves. Operator action will be required to deenergize power to charging flow control valve, and close manual valve located downstream.

Damage to cabling for boric acid supply control valve may cause spurious operation of the valve. Operator action will be required to close manual valve located upstream.

MSS Damage to cabling for condenser steam dump solenoids and S/G sample isolation valves may cause spurious operation. Operator action to deenergize power will be taken to prevent/mitigate spurious operation. Spurious operation of the condenser dump valves, until operator action has been taken, has been evaluated and determined to be acceptable.

AFW Damage to cabling for the AFW bypass isolation valve may cause spurious operation of the valve. This will not affect the operation of the dedicated auxiliary feedwater pump.

CRS Damage to cabling for refueling water pumps may cause spurious operation of the pumps. Operator action will be taken to trip offsite/diesel generator power to deenergize these pumps.

Damage to calling for the containment spray valves may cause spurious operation of the valves. Operator action will be taken to close manual valves located upstream.

SIS Damage to cabling for safety injection recirculation valves may cause spurious operation of the valves. Spurious actuation of these valves will divert flow from the seal injection flowpath to the charging safety injection flowpath. The effects of the spurious actuation have been evaluated and determined to be acceptable.

Effect of Fire on Alternate Shutdown Equipment (contd)

RCS Damage to cabling for alternate shutdown RCS temperature indication may occur. The corresponding dedicated shutdown system instrumentation will remain available.

CCW Damage to cabling for the Thermal Barrier Pump and Thermal Barrier Coil Return Valves may cause spurious operation. Component cooling water is not required to support dedicated shutdown system operation. Interruption of seal cooling and seal injection to the reactor coolant pump seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined acceptable.

SWC Damage to cabling for auxiliary pump may occur. This equipment is not credited for shutdown in this area.

SIS Damage to cabling for safety injection pumps and associated valve cabling may occur. Operator action will be taken to trip offsite/diesel generator power to deenergize these pumps. Damage to cabling for safety injection discharge valves may cause spurious operation. Operator action will be taken to trip main feedwater and safety injection pumps.

FWS Damage to cabling for the main feedwater pumps and associated valves may occur. Operator action will be taken to trip offsite/diesel generator power to deenergize the main feedwater pumps.

Damage to cabling for inlet and outlet isolation valves may occur and could result in spurious operation of the main feedwater valves. This will not impact safe shutdown since the main feedwater pumps are tripped.

Effect of Fire on Dedicated Shutdown Equipment

RSS Damage to cabling for the PASS reactor coolant loop C sample valve may occur. Operator action will be taken to manually open the valve as required to enable sampling of primary system boron concentration via pneumatic override capability provided by backup nitrogen supply for PASS.

Conclusion

The fire detection and suppression systems in the 4160V Switchgear Room provide area wide coverage of fire hazards in this fire area. These systems have been evaluated to provide adequate early fire detection to the ESO and control rooms and adequate fire suppression capability. The fire protection features are expected to adequately mitigate the consequences of the fire and confine it to the area under consideration.

Conclusion (contd)

The dedicated safe shutdown system is credited for this fire area. This system is designed to achieve cold shutdown due to the potential loss of normal shutdown equipment for this zone. The NRC has reviewed and approved the dedicated safe shutdown for this fire area.

The safe shutdown equipment credited for a fire in this area has been evaluated to remain available for safe shutdown due to the fire barriers provided, fire detection/suppression systems, and spacing separation. This fire area meets the requirements of 10CFR50 Appendix R, Section III.G.3.

FIRE AREA/ZONE: 1-PB-20-11A

AREA: 2729 sq.ft. **DESCRIPTION:** CHEMISTRY LAB AND LAVATORIES

COMBUSTIBLES

Oil & Grease	6 lbs.
Cable (30% Fill)	200 lbs.
Class A	1707 lbs.
Charcoal	0 lbs.
Plastics	474 lbs.
Miscellaneous	162 lbs.
Miscellaneous Gases	24 lbs.

DESIGN BASIS FIRE

Fire Loading	9455 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	C/750
Fire Duration	0.12 hrs.

FIRE PROTECTION (AVAILABLE)

Supporession (Type)	none
Hose Stations	(1), (1) in 4D, (1) in 12
Portable Extinguishers	(2)10B:C, (1) 80B:C, (2)2A:40B:C #
Detectors (Type)	ionization (local)

FIRE RESISTANCE RATING

- Walls	3hr/B, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	none
- Penetrations	C,D, ND/11B,12, NC/4D,11D,12
- Doors(UL Class/Zone #)	(2)C/12, A/12, A/29, NR/4A, C/9E

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			1
Main Steam			1
Auxiliary Feedwater			
Component Cooling Water			1 (1)
Saltwater Cooling			
Diesel Generator			1
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			1

SUMMARY

			1, (1)

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		1	
480 V (AC)			
120 V (AC)		1	
125 V (DC)		1	

SUMMARY

		1	

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :NO
Spurious Operation :NO

NOTES
- (1)10B:C in 29

FIRE AREA/ZONE 1-PB-20-11A

Location

Power Block - El. 20'-0" - Chemistry Lab and Lavatories - 2,729 square feet - Fig. 8-A.

Combustible Material	Quantity
Grease	1 gal
Cable insulation	200 lbs
Class A combustibles	1,707 lbs
Plastic	474 lbs
Miscellaneous combustibles	182 lbs
Acetylene	330 C.F.
Hydrogen	60 C.F.

Fire loading - 9,455 Btu/sq ft
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - C/750 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 750 °F and would involve grease, cable insulation, Class A combustibles, plastic, and miscellaneous combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic fire suppression equipment is provided in this zone. Local ionization smoke detectors provide early warning alarm in the ESO and control rooms. Manual fire fighting equipment is available within the zone, in adjacent zone 1-YD-20-4A, and in adjacent areas 1-PB-20-12 and 1-PB-20-29.

Construction

The walls separating this zone from the 4160V switchgear room (1-PB-14-8) are 3 hour rated. The remaining walls of the zone are non-rated reinforced concrete with minimum thickness of 8". The ceiling of the zone is 6 inch reinforced concrete. The floor is concrete slab at grade. Two 3/4 hour rated doors and one 3 hour rated door communicate with the first floor offices (1-PB-20-12).

Construction (contd)

A 3 hour rated door opens to the north stairwell (1-PB-20-29) and a non-rated door opens to the penetration area (1-YD-20-4A). A 3/4 hour door opens to ramp area (1-TB-14-9E). Ventilation duct penetrations to the 4160V switchgear room are provided with 3 hour rated fire dampers.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC):	Train 1:	Control cable:	Bus 1C
120V (AC):	Train 1:	Power cable:	Vital Bus 1 (Y-11)
			Vital Bus 2 (Y-12)
			Vital Bus 3 (Y-13)
			Vital Bus 3A (Y-33)
125V (DC):	Train 1:	Power cable:	Battery Charger A (D02)
		Control cable:	D02

Volume Control and Charging (VCC):

	Train 1:	Control cable:	Charging Flow Control Valve FCV-1112

Main Steam (MSS):

Train 1:	Power cable:	Turbine Stop Valve Actuator PV-1611
		PV-1612
		Steam Generator Blowdown Control Valve CV-100/100B
	Control cable:	Steam Dump Solenoid Valve SV-85
		SV-86
		SV-87
		SV-88

Diesel Generator (DG):

Train 1:	Power cable:	Diesel Fuel Oil Standby Pump G-76
		Exciter Cabinet E-08
		Diesel Local Control Panel C-48
	Control cable:	G-76

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

Component Cooling Water (CCW):

Train 1: Control cable: Thermal Barrier pump G-964

Dedicated Shutdown Equipment

Reactor Cycle Sampling System (RSS):

Train 1: Power cable: PASS Reactor coolant Loop C sample valve CV-956
Control cable: CV-956

Safety Related Equipment Not Required for Safe Shutdown

Essential Electric System (EES):

125V (DC): Train 1: Control cable: DG Panel C-41

Main Feedwater (FWS):

Train 1: Control cable: Feedwater Regulator Valve
FCV-456
FCV-457
FCV-458

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Shutdown Capability

EES Damage to cabling for train 1 4160V system may occur. The train 2 system will remain available.

Damage to cabling for train 1 120V system may occur. The train 2 system will remain available.

Damage to cabling for train 1 125V system may occur. The train 2 system will remain available.

Effects of Fire on Hot Standby Capability (contd)

VCC Damage to control cabling for the charging flow control valve may occur. Operator action to close manual valves located upstream will be required for charging through the seal injection flowpath.

MSS Damage to steam dump control solenoid valves may occur. No mitigation is required as steam dump control through the positioner will remain available.

Damage to cabling for turbine stop valve actuators may occur. Operator action will be taken to trip the turbine at the turbine stand.

Damage to cabling for steam generator blowdown control valves may occur. Operator action will be taken to close manual valves upstream of the valves. Spurious actuation, until operator action has been taken, has been evaluated and determined to be acceptable.

DG Damage to cabling for several train 1 diesel generator components may occur, but will have no affect on safe shutdown since diesel generator 2 is located outside the zone and will remain available.

Effects of Fire on Cold Shutdown Equipment

None

Effects of Fire on High/Low Pressure Interface

None

Effects of Fire on Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

CCW Damage to cabling for the thermal barrier pump may occur but will not affect safe shutdown since component cooling pumps are located outside the zone and will remain available.

Effects of Fire on Dedicated Shutdown Equipment

Damage to power and control cabling for the PASS Reactor coolant loop C sample valve may occur. This will have no adverse impact on safe shutdown capability since the source range neutron flux monitor is located outside the zone and will remain available for determination of shutdown margin.

Conclusion

The ionization smoke detectors installed provide local coverage of the hazards in this fire zone and provide adequate, early fire detection and alarm in the ESO and control rooms. Manual/portable fire fighting equipment is provided in this zone and also within adjacent fire areas/zones. The walls forming the boundary of the zone are 3 hour rated or non-rated reinforced concrete with a minimum thickness of 8". The only non-rated door, a metal door communicating with fire zone 1-YD-20-4A, has approximately 20' horizontal distance between it and the nearest in-situ combustible in 1-YD-20-4A. The design basis fire is postulated to have a fire duration of approximately 0.11 hours, a relatively short duration. The postulated design basis fire does not consider the fire protection features discussed above, and therefore, is very conservative. The fire protection features are expected to adequately mitigate the consequences of the fire and confine it to the zone under consideration.

Normal shutdown is credited for a fire in this zone. The equipment credited for safe shutdown for a fire in this zone has been evaluated to remain available for safe shutdown due to the fire barriers, short fire duration, and spacing separation. This fire zone meets the requirements of 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-PB-32-11B

AREA: 847 sq.ft. **DESCRIPTION:** HVAC EQUIPMENT ROOM

COMBUSTIBLES

Oil & Grease	7 lbs.
Cable (30% Fill)	303 lbs.
Class A	36 lbs.
Charcoal	0 lbs.
Plastics	2 lbs.
Miscellaneous	50 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	6264 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	B/450
Fire Duration	0.08 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 29'
Portable Extinguishers	(1)10B:C,(1)4A:40B:C
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr/8, NR/11C, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	DP/11D, DP/31B, LV/4J
- Penetrations	C,P,NC/11C,4J,ND/11A,11C,31B,11D,12 ##
- Doors(UL Class/Zone #)	B/31B, C/11C, NR/9E

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

NOTES
NP/exterior

FIRE AREA/ZONE 1-PB-32-11B

Location

Power Block - El. 32'-0" - HVAC Equipment Room - 847 square feet - Fig. 8-B.

Combustible Material	Quantity
Grease	1 gal
Cable insulation	302 lbs
Class A combustibles	36 lbs
Plastic	2 lbs
Miscellaneous combustibles	50 lbs

Fire loading - 6,264 Btu/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - B/450 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 450 °F and would involve grease, cable insulation, Class A combustibles, plastic, and miscellaneous combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic fire suppression equipment is provided in this zone. Ionization smoke detectors, located within the zone, provide early warning alarm in the ESO and control rooms. Manual fire fighting equipment is available within the zone and in adjacent areas 1-PB-20-29 and 1-PB-32-14, and adjacent zones 1-PB-32-11C and 1-PB-20-31B.

Construction

The walls separating the zone from the 4160V switchgear room (1-PB-14-8) are 3 hour rated. The remaining walls, floor, and ceiling of the zone are non-rated reinforced concrete with a thickness of 8 inches. A 1-1/2 hour rated door separates the area from the south stairwell (1-PB-20-31B). A 3/4 hour rated door communicates with the second floor office (1-PB-32-11C). A non-rated door in the west wall opens to the exterior. Ventilation duct penetrations and the louvered ventilation openings in the west wall are not provided with fire dampers.

Equipment Required for Hot Standby

None

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

Control Room Air Conditioning Unit A-31

Emergency Makeup Fan A-33

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-3, sheet 3.

Effects of Fire on Hot Standby Capability

None

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusion

The ionizaton smoke detectors installed provide coverage of the hazards in this fire zone and provide adequate, early fire detection and alarm in the ESO and control rooms. Manual/portable firefighting equipment is provided in this zone and also within adjacent fire areas/zones. The walls forming the boundary of this zone are 3 hour rated or non-rated reinforced concrete with a minimum thickness of 8 inches. The design basis fire is postulated to be of a relatively short duration with a heat rate of 450°F, also relatively low. The postulated design basis fire does not consider the fire protection features discussed above, and therefore, is very conservative. The fire protection features are expected to adequately mitigate the consequences of the fire and confine it to the zone under consideration.

Normal shutdown is credited for a fire in this zone. The fire will not affect the capability to achieve and maintain cold shutdown, as there are no safe shutdown components or cables within this zone. The fire zone complies with the requirements of 10CFR50, Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-PB-30-11C

AREA: 260 sq.ft. **DESCRIPTION:** COUNTING ROOM

COMBUSTIBLES

Oil & Grease	14 lbs.
Cable (30% Fill)	44 lbs.
Class A	587 lbs.
Charcoal	0 lbs.
Plastics	60 lbs.
Miscellaneous	20 lbs.
Miscellaneous Gases	4 lbs.

DESIGN BASIS FIRE

Fire Loading	26158 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1450
Fire Duration	0.33 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 29
Portable Extinguishers	(1)4A:40B:C, (1)10B:C, (1)4A:40B:C #
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	NR/11B,11E, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	none
- Penetrations	P,C, ND/11B, NC/11B
- Doors(UL Class/Zone #)	C/11B,11D, B/29, NR/11E

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

NOTES

- (1)10B:C IN 11B

FIRE AREA/ZONE: 1-PB-30-11D

AREA: 557 sq.ft. **DESCRIPTION:** COMMUNICATIONS ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	508 lbs.
Class A	811 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	25 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	24198 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	C/900
Fire Duration	0.30 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 29
Portable Extinguishers	(1)4A:40B:C, (1)10B:C, (1)10B:C & #
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr/8, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	OP/11B
- Penetrations	C, NC/4A,23,29,11A,30A
- Doors(UL Class/Zone #)	C/11C

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

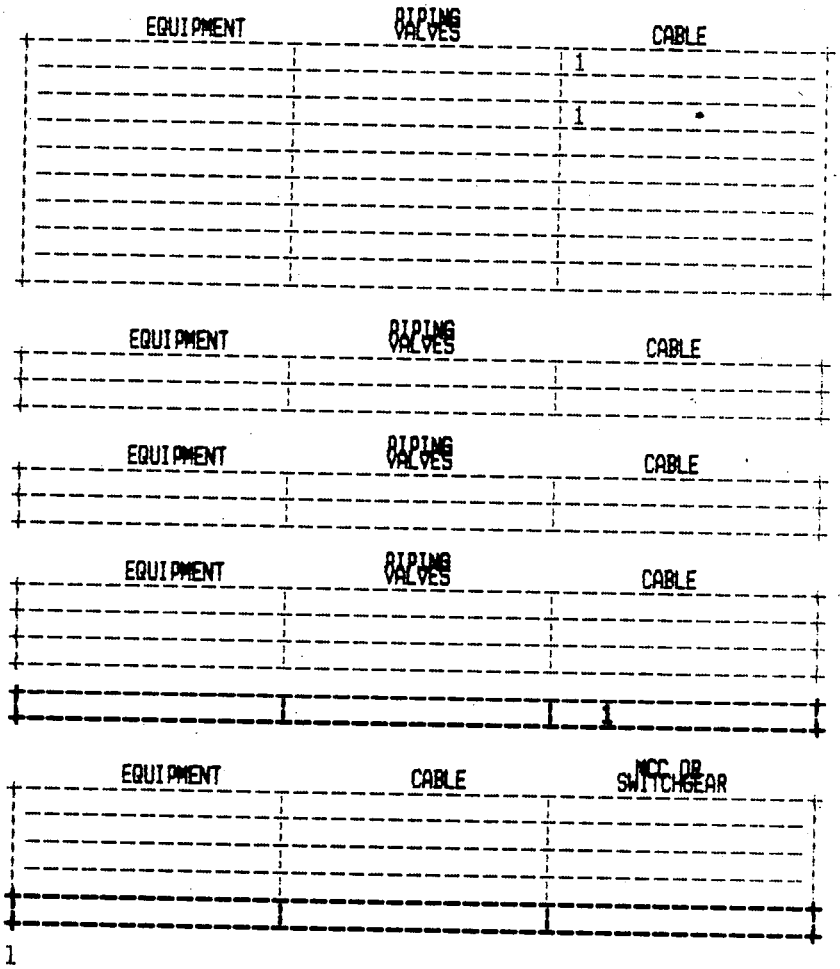
ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

SUMMARY



ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

NOTES

- (1)4A:40B:C in 11C

FIRE AREA/ZONE 1-PB-30-11D

Location

Power Block - El. 30'-0" - Communications Room - 557 square feet - Fig. 8-B.

Combustible Material	Quantity
Cable insulation	508 lbs.
Class A combustibles	811 lbs.
Miscellaneous combustibles	25 lbs.

Fire loading - 24,198 Btu/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - C/900

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 900°F and would involve cable insulation, Class A combustibles, and miscellaneous combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic fire suppression equipment is provided for this zone. Ionization smoke detectors are installed and provide early warning alarm in the ESO and control rooms. Manual fire fighting equipment is provided within the zone and in adjacent areas/zones.

Construction

A 3 hour rated wall separates this zone from the 4160V Switchgear Room (1-PB-14-8). The remaining walls, floor, and ceiling are non-rated reinforced concrete. A 3/4 hour rated door communicates with the Counting Room (1-PB-30-11C).

Equipment Required for Hot Standby

Main Steam System (MSS):

Train 1: Power cable: Steam Generator Blowdown Control Valve CV-100/100B
Control cable: CV-100/100B

Reactor Coolant System (RCS):

Train 1: Instrumentation cable: NE-1201
NE-1202

Cold Shutdown Equipment

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capabilities

MSS Damage to cabling for steam generator blowdown control valves may occur. Operator action will be taken to close manual valves upstream. Spurious actuation, until operator action has been taken, has been evaluated and determined to be acceptable.

RCS Damage to cabling for the source range flux monitors may occur. Redundant source range neutron flux level indication is available at NIS cabinet C115 in the control room, and will be unaffected by loss of these cables.

Effects of Fire on Cold Shutdown Equipment

None

Effects of Fire on High/Low Pressure Interface

None

Effects of Fire on Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Conclusion

The ionization smoke detectors installed provide coverage of the hazards in this fire zone and provide adequate, early fire detection and alarm in the ESO and control rooms. Manual/portable fire fighting equipment is provided in this zone and also within adjacent fire area/zones. The walls forming the boundary of this zone are 3 hour rated or non-rated reinforced concrete. The design basis fire is postulated to be of a relatively short duration, approximately 16 minutes, with a heat rate of 900°F. The postulated design basis fire does not consider the fire protection features discussed above, and therefore is very conservative. The fire protection features are expected to adequately mitigate the consequences of fire and confine it to the zone under consideration.

Normal shutdown is credited for a fire in this zone. The equipment credited for safe shutdown for a fire in this zone has been evaluated to remain available for safe shutdown due to the fire barriers, short fire duration, and spacing separation. This fire zone meets the requirements of 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-PB-30-11E

AREA: 35 sq.ft. **DESCRIPTION:** RADIOACTIVE MATERIAL STORAGE ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	124 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	2 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	29451 BTU's/sq.ft.
Fire Loading - Max Permissible	30000 BTU's/sq.ft.
Heat Rate (degrees F)	C/1000
Fire Duration	0.37 hrs.

FIRE PROTECTION (AVAILABLE)

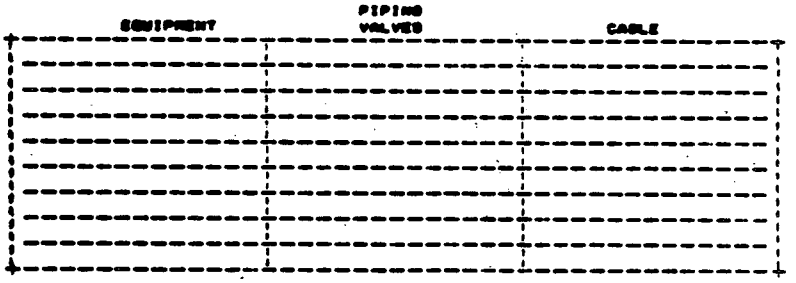
Suppression (Type)	none
Hose Stations	none, (1) in 29
Portable Extinguishers	none, (1)10B:C, (1)4A:40B:C in 11C
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	NR/11C, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	none
- Penetrations	none
- Doors(UL Class/Zone #)	NR/11C

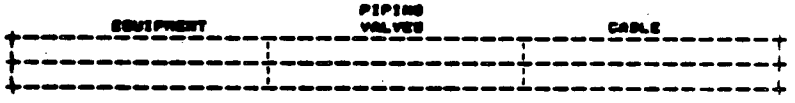
HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation



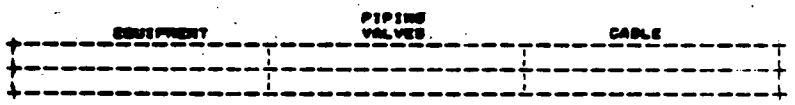
COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)



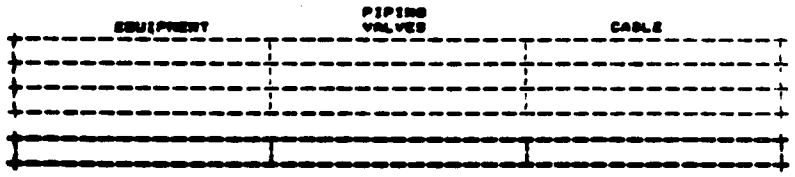
ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling



DEDICATED SHUTDOWN SYSTEMS

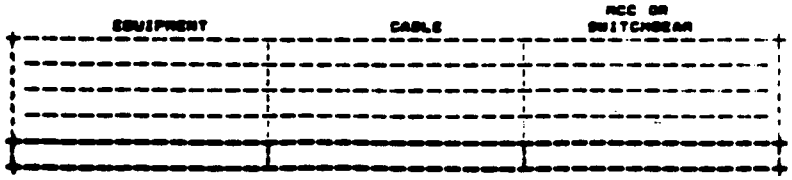
Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)



SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)



SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE: 1-PB-20-12

AREA: 8955 sq.ft. **DESCRIPTION:** OFFICES - FIRST & SECOND FLOORS

COMBUSTIBLES

Oil & Grease	7 lbs.
Cable (30% Fill)	665 lbs.
Class A	13800 lbs.
Charcoal	0 lbs.
Plastics	550 lbs.
Miscellaneous	5831 lbs.
Miscellaneous Gases	129 lbs.

DESIGN BASIS FIRE

Fire Loading	82578 BTU's/sq.ft.
Fire Loading - Max Permissible	150000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1400
Fire Duration	0.28 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	wet pipe sprinklers
Hose Stations	(1), (1) in 11A
Portable Extinguishers	(6)2A:40B:C, (1)4A:40B:C
Detectors (Type)	ionization (local)

FIRE RESISTANCE RATING

- Walls	1hr/13A,13B,13C,NR/ext,HC/ext,11A,11B,
- Floors,Ceiling or Roof	HC
- Fixed Openings	none
- Penetrations	P,C, ND/11B,11A,ext, NC/11A
- Doors(UL Class/Zone #)	B/31B,exterior,(2)C/11A,A/11A

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			1
Main Steam			1
Auxiliary Feedwater			
Component Cooling Water			(1)
Saltwater Cooling			
Diesel Generator			1
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY 1, (1)

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)		1	
120 V (AC)		1	
125 V (DC)			
SUMMARY		1	

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No

Spurious Operation :No

FIRE AREA/ZONE 1-PB-20-12

Location

Power Block - El. 20'-0" - First and Second Floor Offices - 8,955 square feet - Fig. 8-A.

Combustible Material	Quantity
Cable insulation	665 lbs
Class A combustibles	13,800 lbs
Plastic	550 lbs
Carpet	5,831 lbs
Acytolene	3 cu ft
Oil	1 gal

Fire loading - 22,576 Btu/sq ft
Maximum permissible fire loading - 160,000 Btu/sq ft
Heat Rate - E/1700 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1700 °F and would involve cable insulation, Class A combustibles, plastic, and miscellaneous combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

An automatic wet pipe sprinkler system provides area wide coverage. Ionization detectors, located locally in the zone, provide early warning alarm in the ESO office and control room. Manual fire fighting equipment is provided within the area and in adjacent zones 1-PB-20-31B and 1-PB-20-11A.

Construction

The walls separating the area from the battery room, the battery room attic, and DC switchgear room (1-PB-20-13A and 1-PB-20-13B) are 1 hour rated. The east wall of the zone is non-rated metal studs and metal siding. Part of the north wall is non-rated reinforced concrete with an approximate thickness of 13 inches while the remainder is non-rated metal siding on metal studs. The west wall to the chem lab (1-PB-20-11A) and the exterior is reinforced concrete with a minimum thickness of 8". Three doors open to the chem lab - two 3-hr and one 3/4-hour (1-PB-20-11A). A one hour door opens to the south stairway (1-PB-20-31B). A one hour door communicates with the exterior. Ventilation duct penetrations are not provided with fire dampers. A portion of the south wall is metal siding on metal studs.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

120V(AC):	Train 1:	Power cable:	Vital Bus 1 (Y11) Vital Bus 2 (Y12) Vital Bus 3 (Y13) Vital Bus 3A (Y33)
125V(DC):	Train 1:	Power cable:	Battery Charger A (D02)
		Control cable:	D02

Volume Control and Charging (VCC):

	Train 1:	Control cable:	Charging Flow Control Valve FCV-1112

Main Steam (MSS):

	Train 1:	Power cable:	Turbine Stop Valve Actuator PV-1611 PV-1612 Steam Blowdown Control Valve CV-100/100B
		Control cable:	Steam Dump Solenoid Valve SV-85 SV-86 SV-87 SV-88

Equipment Required for Hot Standby (contd)

Diesel Generator Systems (DG):

Train 1: Power cable: Diesel Fuel Standby Pump G-76
Diesel Local Control Panel C-48
Exciter Cabinet E-08
Control cable: G-76

Cold Shutdown Equipment

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

Component Cooling Water (CCW):

Train 1: Control cable: RCP Thermal Barrier
Pump G-964

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

Essential Electric Systems: 125V(DC): Train 1: Control cable: DG Panel C-41

Main Feedwater System (FWS):

Train 1: Control cable: FCV-456
FCV-457
FCV-458

Technical Specification Barriers

For area/zone of the barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for train 1 120V and 125V electrical systems may occur. The train 2 system will remain available for shutdown.

Effects of Fire on Hot Standby Capability (contd)

VCC Damage to control cabling for charging flow control valve may occur. Operator action will be taken to close manual valves located upstream for charging through the seal injection flowpath.

MSS Damage to cabling for steam dump solenoid valves may occur but will have no affect on safe shutdown since steam dump control through the positioner will remain available.

Damage to power cabling for turbine stop valve actuators may occur. Operator action will be taken to trip the turbine at the turbine stand.

Damage to power cabling for steam generator blowdown control valves may occur. Operator action will be taken to close manual valves upstream. Spurious actuation, until operator action has been taken, has been evaluated and determined to be acceptable.

DG Damage to cabling for train 1 diesel local control panel, exciter cabinet and fuel oil standby pump may occur. Diesel generator 2 and its support equipment is located outside the area and will remain available.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

CCW Loss of control of RCP thermal barrier pump may occur, but will have no affect on safe shutdown since component cooling pumps are located outside the area and will remain available.

Effects of Fire on Dedictated Shutdown

None

Conclusion

The ionization smoke detectors installed locally within the first floor office area provides coverage for the area containing the cable tray in which safe shutdown circuits are found. These detectors provide adequate early warning alarm to the ESO office and control room. The automatic wet pipe sprinkler system provides adequate protection for the entire fire area. The walls forming boundaries with other fire areas/zones containing safe shutdown components are one hour rated or concrete construction. The exterior walls are non-rated but have a wide separation from any safe shutdown components. The design basis fire is postulated to have a duration of approximately twenty minutes. The postulated design basis fire does not consider the fire protection features discussed above, and therefore, is very conservative. The fire protection features are expected to adequately mitigate the consequences of the fire and confine it to the area under consideration.

Normal shutdown is credited for a fire in this zone. The area complies with the requirements of 10CFR50 Appendix R, Section III.G.1. The equipment credited for safe shutdown has been evaluated to remain available for safe shutdown due to the barriers, spacing separation, and fire protection features provided.

FIRE AREA/ZONE: 1-PB-20-13A

AREA: 442 sq.ft. **DESCRIPTION:** DC SWITCHGEAR ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	1229 lbs.
Class A	30 lbs.
Charcoal	0 lbs.
Plastics	12 lbs.
Miscellaneous	1 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	36485 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	C/1150
Fire Duration	0.46 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, hydrants on fire main
Portable Extinguishers	none, (1)4A:40B:C in 4J, (1)80B:C in 4J
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	1hr/13B,13C, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	OP/exterior
- Penetrations	D,C,P, ND/ext., NP/ext., NC/ext., QD/13B
- Doors(UL Class/Zone #)	NR/exterior, A/13B, B/13C

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			1
Volume Control & Charging			1
Main Steam			1
Auxiliary Feedwater			
Component Cooling Water			(1)
Saltwater Cooling			
Diesel Generator			1
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

			1,(1)

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		1	
480 V (AC)			
120 V (AC)	1	1	
125 V (DC)	1	1	
SUMMARY	1	1	

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE 1-PB-20-13A

Location

Power Block - El. 20'-0" - DC Switchgear Room - 442 square feet - Fig. 8-A.

Combustible Material	Quantity
Cable insulation	1,229 lbs
Class A combustibles	30 lbs
Plastic	12 lbs
Miscellaneous combustibles	1 lb

Fire loading - 36,485 Btu/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - C/1150 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1150 °F and would involve cable insulation, Class A combustibles, plastic, and miscellaneous combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic or manual fire fighting equipment is available within the zone. Ionization smoke detectors, located within the zone, provide early warning alarm in the ESO office and control rooms. Manual fire fighting equipment is available outside the south entrance to the zone. Hose streams are also available from yard hydrants.

Construction

The north wall of the zone is 1 hour rated. The south wall is non-rated reinforced concrete construction with an approximate thickness of 13 inches. The east wall of the zone is a 1 hour rated plaster partition. The west wall is non-rated reinforced concrete construction with an approximate thickness of 8 inches. The floor and roof are non-rated. A 3 hour rated door separates the zone from battery room No. 1 (1-PB-20-13B). A non-rated door in the south

Construction (contd)

wall opens to the zone from the exterior. A 1 hour rated hatch allows access to the adjacent battery room attic (1-PB-29-13C). Ventilation duct penetrations are provided with 1-1/2 hour rated fire dampers.

The installation of a 1 1/2 hour damper (identified as non-rated in the matrix) in the wall communicating with fire zone 1-PB-20-13 does not meet the manufacturer's installation requirements. An evaluation of the fire protection systems provided in the area, the combustible loading, the construction of the dampers, and the location of combustibles and safe shutdown circuitry in the vicinity of the dampers has been conducted to document the adequacy of the existing configuration.

Equipment Required for Hot Standby

Essential Electric System (EES):

4160V(AC):	Train 1:	Power cable: Bus 1C
120V(AC):	Train 1:	Inverter 1 (YV11)
		Inverter 2 (YV12)
		Inverter 3 (YV13)
		Power cable: Inverter 4
		Vital Bus 1 (Y11)
		Vital Bus 2 (Y12)
		Vital Bus 3 (Y13)
		Vital Bus 3A (Y33)
		YV-11
		YV-12
		YV-13
125V(DC):	Train 1:	DC Bus (D01)
		Battery Charger A (D02)
		Battery Charger B (D03)
		Power cable: D01
		D02
		D03
		D04
		Control cable: D02, D03

Reactor Coolant System (RCS):

	Train 1:	Power cable: RPS Trip Circuits

Volume Control and Charging (VCC):

	Train 1:	Control Cable: Charging Flow Control Valve FCV-1112

Equipment Required for Hot Standby (contd)

Main Steam (MSS): Train 1: Power cable: Turbine Stop Valve Actuator
PV-1611
PV-1612
Steam Generator Blowdown
Control Valve CV-100/1008
Control cable: Steam Dump Solenoid Valve
SV-85
SV-86
SV-87
SV-88

Diesel Generator (DG): Train 1: Power cable: Local Control Panel C-48
Exciter Cabinet E-08
Fuel Oil Standby Pump G-76
Control cable: G-76

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

Component Cooling Water (CCW):

Train 1: Power cable: RCP Thermal Barrier Pump G-964
Control cable: G-964

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

Essential Electric Systems (EES):

125V(DC): Train 1: Control cable: DG Panel C-41

Main Feedwater System (FWS):

Train 1: Control cables: FCV-456
FCV-457
FCV-458

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling and equipment for train 1 4160V, 120V and 125V electrical systems may occur. The train 2 system will remain available for shutdown.

RCS Damage to cabling for RPS trip circuits may occur. This will not impact safe shutdown since reactor scram is initiated if power to D07 is lost.

VCC Damage to cabling for flow control valve may occur. Operator action to close manual valves located upstream will be required for charging through the seal injection flowpath.

MSS Damage to cabling for steam dump solenoid valves may occur with no affect on safe shutdown since steam dump control through the positioner will remain available.

Damage to cabling for turbine stop valve actuator PV-1611 and PV-1612 may occur. Operator action will be taken to trip the turbine at the turbine stand.

Damage to cabling for steam generator blowdown control valves may occur. Operator action will be taken to close manual valves upstream. Spurious actuation, until operator action has been taken, has been evaluated and determined to be acceptable.

Effects of Fire on Hot Standby Capability (contd)

DG Damage to cabling for train 1 local control panel, exciter cabinet and fuel oil standby pump may occur, but will have no affect on safe shutdown, since diesel generator 2 is located outside the zone and will remain available.

FIRE AREA/ZONE 1-PB-20-13A

Effects of Fire on Cold Shutdown

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown

CCW Damage to cabling for RCP thermal barrier pump may occur. Component cooling water pumps are located outside the zone and will remain available.

Effects of Fire on Dedicated Shutdown

None

Conclusion

The ionization smoke detectors installed provide coverage of the hazard in this fire zone and provide adequate early fire detection and alarms in the ESO office and control room. Manual fire fighting equipment is provided in adjacent fire areas/zones. The wall forming the boundary of this zone are 1 hour rated and/or non-rated reinforced concrete. The design basis fire is postulated to be of a relatively short duration, approximately 28 minutes, with a heat rate of 1150°F. The postulated design basis fire does not consider the fire protection features discussed above, and therefore, is very conservative. The fire protection features are expected to adequately mitigate the consequences of fire and confine it to the zone under consideration.

Normal shutdown is credited for a fire in this zone. The equipment credited for safe shutdown for a fire in this zone has been evaluated to remain available for safe shutdown due to the fire barriers, short fire duration, and spacing separation. This fire zone meets the requirements of 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-PB-20-13B

AREA: 390 sq.ft. **DESCRIPTION:** BATTERY ROOM NO. 1

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	193 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	9166 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	B/500
Fire Duration	0.11 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, hydrants on fire main
Portable Extinguishers	none, (1)4A:40B:C, (1)80B:C in 4J
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	1hr/north, west, HC/south, CB/east
- Floors,Ceiling or Roof	1hr/ceiling, HC/floor
- Fixed Openings	none
- Penetrations	P,C,D, QD/13A,13C
- Doors(UL Class/Zone #)	A/13A

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR
1	1	

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE 1-PB-20-13B

Location

Power Block - El. 20'-0" - Battery Room No. 1 - 390 square feet - Fig. 8-A.

Combustible Material	Quantity
Plastic	193 lbs

Fire loading - 9,166 Btu/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - B/500 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 500 °F and would involve plastic battery cases.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic or manual fire fighting equipment is provided within the zone. Ionization detectors provide early warning alarm in the ESO office and control room. Manual fire fighting equipment is available outside the south entrance to adjacent zone 1-PB-20- 13A. Hose streams are also available from yard hydrants.

Construction

The west and north walls of the zone are 1 hour rated. The exterior walls are non-rated concrete or concrete block with a minimum thickness of 8 inches. The ceiling is composed of plaster on metal lath and is 1 hour rated. A 3 hour rated door separates the zone from the DC switchgear room (1-PB-20-13A). Ventilation duct penetrations are provided with 1-1/2 hour rated fire dampers.

The installation of a 1 1/2 hour damper and a 3 hour damper (identified as non-rated in the matrix) in the wall communicating with fire zones 1-PB-20-13A and 1-PB-29-13C respectively, do not meet the manufacturer's installation requirements. An evaluation of the fire protection systems provided in the area, the combustible loading, the construction of the dampers, and the location of combustibles and safe shutdown circuitry in the vicinity of the dampers has been conducted to document the adequacy of the existing configuration.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

125V(DC): Train 1: Battery No. 1 (D04)
Power cable: D04

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capabilities

EES Damage to 125V electrical system may occur. The train 2 electrical distribution systems are located outside the zone and will remain available.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusion

The ionization smoke detectors installed provide coverage of the hazard in this fire zone and provide adequate early fire detection and alarm in the ESO office and control room. Manual fire fighting equipment is provided in adjacent fire areas/zones. The walls forming the boundary of this zone are 1 hour rated and/or non-rated reinforced concrete. The design basis fire is postulated to be of a relatively short duration, approximately 7 minutes, with a heat rate of 500°F. The postulated design basis fire does not consider the fire protection features discussed above, and therefore, is very conservative. The fire protection features are expected to adequately mitigate the consequences of fire and confine it to the zone under consideration.

Normal shutdown is credited for a fire in this zone. The equipment credited for safe shutdown for a fire in this zone has been evaluated to remain available for safe shutdown due to the fire barriers, short fire duration, and spacing separation. This fire zone meets the requirements of 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-PB-29-13C

AREA: 390 sq.ft. **DESCRIPTION:** BATTERY ROOM ATTIC

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	42 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	1366 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	A/150
Fire Duration	0.02 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none
Portable Extinguishers	none, (1)4A:40B:C, (1)80B:C in 4J
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	1hr/12,13A, HC/south, CB/east
- Floors,Ceiling or Roof	1hr/floor, HC/ceiling
- Fixed Openings	none
- Penetrations	P,C,D, QD/13B
- Doors(UL Class/Zone #)	B/13A

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			1
Auxiliary Feedwater			
Component Cooling Water			(1)
Saltwater Cooling			
Diesel Generator			1
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

			1,(1)

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		1	
480 V (AC)			
120 V (AC)		1	
125 V (DC)		1	
SUMMARY		1	

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE 1-PB-29-13C

Location

Power Block - El. 29'-0" - Battery Room Attic - 390 square feet - Fig. 8-A.

Combustible Material	Quantity
Cable insulation	42 lbs

Fire loading - 1,366 Btu/sq ft
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - A/150 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 150 °F and would involve cable insulation.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic or manual fire fighting or fire detection equipment is provided within the zone. Manual fire fighting equipment is available outside the south entrance to adjacent zone 1-PB-20-13A. Hose streams are also available from yard hydrants.

Construction

The west wall of the zone, adjoining the DC switchgear room (1-PB-20-13A), is plaster on metal studs and 1 hour rated from the DC Switchgear side. The north wall is 1 hour rated 8-inch thick concrete block. The exterior walls are non-rated concrete or concrete block with a minimum thickness of 8 inches. The floor of the zone is plaster on metal lath and is 1 hour rated. The ceiling is 7-1/2-inch thick reinforced concrete. Access to the zone is through a 1-1/2 hour rated hatch in the west wall of the zone. Ventilation duct penetrations in the zone are provided with 1 hour rated fire dampers.

The installation of a 3 hour damper (identified as non-rated in the matrix) in the wall communicating with fire zone 1-PB-20-13B does not meet the manufacturer's installation requirements. An evaluation of the fire protection systems provided in the area, the combustible loading, the construction of the dampers, and the location of combustibles and safe shutdown circuitry in the vicinity of the dampers has been conducted to document the adequacy of the existing configuration.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V(AC):	Train 1:	Power cable:	Bus 1C
120V(AC):	Train 1:	Power cable:	Vital bus 1 (Y11) Vital bus 2 (Y12) Vital bus 3 (Y13) Vital bus 3A (Y33)
125V(DC):	Train 1:	Power cable:	Battery Charger A (D02)
		Control cable:	D02

Main Steam System (MSS):

	Train 1:	Power Cable:	Turbine Stop Valve Actuator PV-1611 PV-1612 Steam Blowdown Control Valves CV-100/100B
		Control cable:	Steam Dump Solenoid Valve SV-85 SV-86 SV-87 SV-88

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

Component Cooling Water (CCW):

	Train 1:	Control cable:	RCP Thermal Barrier Pump G-964

Dedicated Shutdown Equipment

None

Safety-Related Equipment Not Required for Safe Shutdown

Essential Electric Systems (EES):

125V (DC): Train 1: Control cable: DG Panel C-41

Technical Specification Barriers

For area/zone barriers requiring surveillance per Technical Specification refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to 125V train 1 4160V, 120V and electrical system may occur. The train 2 system will remain available for shutdown.

MSS Damage to cabling for steam dump solenoid valves may occur. Steam dump control through the positioner will remain available.

Damage to cabling for turbine stop valve actuators may occur. Operator action will be taken to trip the turbine at the turbine stand.

Damage to cabling for steam generator blowdown control valves may occur. Operator action will be taken to close manual valves upstream. Spurious actuation, until operator action has been taken, has been evaluated and determined to be acceptable.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

CCW Damage to cabling for RCP thermal barrier pump may occur. Component cooling pumps and cabling are located outside the zone and will remain available.

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusion

The ionization smoke detectors installed provide coverage of the hazard in this fire zone and provide adequate early fire detection and alarm in the ESO office and control room. Manual fire fighting equipment is provided in adjacent fire areas/zones. The walls forming the boundary of this zone are 1 hour rated or non-rated reinforced concrete. The design basis fire is postulated to be of a relatively short duration, approximately 2 minutes, with a heat rate of 150°F. The postulated design basis fire does not consider the fire protection features discussed above, and therefore, is very conservative. The fire protection features are expected to adequately mitigate the consequences of fire and confine it to the zone under consideration.

Normal shutdown is credited for a fire in this zone. The equipment credited for safe shutdown for a fire in this zone has been evaluated to remain available for safe shutdown due to the fire barriers, short fire duration, and spacing separation. This fire zone meets the requirements of 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-PB-32-14

AREA: 268 sq.ft. **DESCRIPTION:** INSTRUMENT SHOP - SECOND FLOOR

COMBUSTIBLES

Oil & Grease	2 lbs.
Cable (30% Fill)	0 lbs.
Class A	5792 lbs.
Charcoal	0 lbs.
Plastics	163 lbs.
Miscellaneous	16 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	177084 BTU's/sq.ft.
Fire Loading - Max Permissible	200000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1900
Fire Duration	2.21 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 9B
Portable Extinguishers	(1)4A:40B:C, (1)10B:C in 11B
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	3hr/8, HC/others
- Fixed Openings	none
- Penetrations	ND/exterior
- Doors(UL Class/Zone #)	(2)C/exterior

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE: 1-PB-35-15

AREA: 268 sq.ft. **DESCRIPTION:** TSC HVAC ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	21 lbs.
Charcoal	276 lbs.
Plastics	12 lbs.
Miscellaneous	5 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	14739 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	B/600
Fire Duration	0.18 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	manual water spray on charcoal filter
Hose Stations	none, hydrants on fire main
Portable Extinguishers	none, (1)4A:40B:C in 4J
Detectors (Type)	ionization, temp. detector for charcoal

FIRE RESISTANCE RATING

- Walls	HC/31B, NR/others
- Floors,Ceiling or Roof	NR/ceiling, HC/floor
- Fixed Openings	OD/exterior, LV/exterior
- Penetrations	P,C,D, NP/4J, NC/4J, ND/4J
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE: 1-PB-42-16

AREA: 3536 sq.ft. **DESCRIPTION:** CONTROL ROOM COMPLEX

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	3002 lbs.
Class A	25099 lbs.
Charcoal	0 lbs.
Plastics	1224 lbs.
Miscellaneous	2139 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	78824 BTU's/sq.ft.
Fire Loading - Max Permissible	160000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1700
Fire Duration	0.99 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	(1), (1) in 31B
Portable Extinguishers	(3)2A:60B:C,(1)10B:C,(3)8B:C, (1)2A:80B:C
Detectors (Type)	ionization (local)

FIRE RESISTANCE RATING

- Walls	3hr
- Floors,Ceiling or Roof	3hr/floor, HC/ceiling
- Fixed Openings	none
- Penetrations	P,C,D
- Doors(UL Class/Zone #)	A/30A,31B, (2)A/29

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			1,2,(1)
Volume Control & Charging			1,2,3
Main Steam	2		1,2
Auxiliary Feedwater			1,2
Component Cooling Water			1,(1),2
Saltwater Cooling			1,2
Diesel Generator			1,2
Gaseous Nitrogen			2
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal	1		1,2
Component Cooling Wtr (to RHR)			1

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			1,2,3
Auxiliary Saltwater Cooling			2

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant	1		
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			J,1,2

SUMMARY

	EQUIPMENT	PIPING VALVES	CABLE
	1,2		1,2,3,(123)J

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		1,2	
480 V (AC)		1,2	
120 V (AC)	1,2	1,2	
125 V (DC)			
SUMMARY	1,2	1,2	

SHUTDOWN SYSTEM CREDITED :Dedicated

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :Yes(SEE TEXT)
Spurious Operation :Yes(SEE TEXT)

FIRE AREA/ZONE 1-PB-42-16

Location

Power Block - El. 42'-0" - Control Room Complex - 3536 square feet, Fig. 8-B.

Combustible Material	Quantity
Cable insulation	3,002 lbs
Class A combustibles	25,099 lbs
Plastic	1,224 lbs
Carpet	1,035 sq ft
Miscellaneous combustibles	90 lbs

Fire loading - 78,824 Btu/sq ft
Maximum permissible fire loading - 160,000 Btu/sq ft
Heat Rate - E/1700 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1700 °F and would involve cable insulation, Class A combustibles, plastic, carpet, and miscellaneous combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

No automatic fire suppression system is available in the zone. Ionization smoke detectors are located in the back panel area, the technical support center, the kitchen, the computer room, and within the vital bus cabinet and the main control console. These detectors provide early warning alarm in the ESO office and control rooms. Manual fire fighting equipment is available within the area and in adjacent zones 1-PB-42-30A, 1-PB-42-31A, and 1-PB-20-31B.

Construction

The floor and walls of the area are 3 hour rated. A suspended acoustical tile ceiling is provided throughout the area, except in the back panel areas. The roof is non-rated concrete with an approximate thickness of 7-1/2 inches. The control room is separated from the north stairway (1-PB-20-29), the chemical

Construction (contd)

control laboratory (1-PB-42-30A) and the south stairwell (1-PB-20-31B) by 3 hour rated doors. Ventilation duct penetrations in the floor and walls are provided with 3 hour rated fire dampers.

Equipment Required for Hot Standby

Essential Electric System (EES):

4160V(AC):	Train 1:	Control cable:	Bus 1A
			Bus 1C
	Train 2:	Control cable:	Bus 2C
480V(AC):	Train 1:	Control cable:	Switchgear 1
	Train 2:	Control cable:	Switchgear 2
		Control cable:	Switchgear 4
120V(AC):	Train 1:	Vital Bus 1 (Y11)	
		Vital Bus 2 (Y12)	
		Vital Bus 3 (Y13)	
		Vital Bus 3A (Y33)	
		Regulated Bus 1 (Y-11R)	
		Regulated Bus 2 (Y-12R)	
		Regulated Bus 3 (Y-13R)	
		Power cable:	Y11
			Y12
			Y13
			Y33
			INV-4
			Y-11R
			Y-12R
			Y-13R
	Train 2:	Vital Bus 4 (Y14)	
		Vital Bus 5 (Y29)	
		Regulated Bus 4 (Y14R)	
		Power cable:	Y14
			Y29
			Y14R
			Utility Bus (Y15)
			37.5/7.5 kVA Transformer

Equipment Required for Hot Standby (contd)

Reactor Coolant System (RCS):

Train 1: Power cable: Block Valve CV-530
CV-531
PORV CV-545
CV-546
Neutron Source
Range Monitor: NE-1201
NE-1202
Pressurizer Level LT-431

Control cable: CV-530
CV-531
CV-545
CV-546
Pressurizer Heater Groups
A & C
RPS Trip Circuits

Instrumentation cable: NE-1201
NE-1202
LT-431
Pressurizer Pressure:
PT-430
PT-431
Hot Leg Temperature
TE-2401A
TE-2412A
TE-2422A
Cold Leg Temperature
TE-402C
TE-3412C
TE-422C

Train 2: Power Cable: Pressurizer Level: LT-435
Pressurizer Pressure: PT-425

Control cable: Pressurizer Heater Group B & D

Instrumentation cable: LT-435
PT-425
Hot Leg Temperature
TE-3402A
TE-3411A
TE-3421A

Equipment Required for Hot Standby (contd)

Volume Control and Charging (VCC):

Train 1: Power cable: Charging Flow Control Valve FCV-1112
Control cable: FCV-1112
Charging pump G-8B
RWST Charging Isolation Valve MOV-1100B
MOV-1100E
Instrumentation cable: Charging Flow FT-1112

Train 2: Power cable: Seal Injection Flow Control Valve FCV-1115A
FCV-1115B
FCV-1115C
RCP Seal Flow Pressure Controller PCV-1115A
PCV-1115B
PCV-1115C
Control cable: Charging Pump G-8A
CV-304
FCV-1115A
FCV-1115B
FCV-1115C
PCV-1115A
PCV-1115B
PCV-1115C
RWST Charging Isolation Valve MOV-1100D
Instrumentation cable: RCP Seal Flow Pressure PT-1115A
PT-1115B
PT-1115C
RCP Seal Pressure Controller PC-1115A
PC-1115B
PC-1115C
RCP Seal Return Flow Indicator PI-1115A
PI-1115B
PI-1115C
Volume Control Tank Level LT-1100

Train 3: Control cable: RWST Charging Isolation Return MOV-883

Equipment Required for Hot Standby (contd)

Main Steam (MSS):

Train 1: Power cable: Turbine Stop Valve Actuator
PV-1611
PV-1612
S/G Level LT-2400A
LT-2400B
LT-2400C
Steam Blowdown Control Valve
CV-100/100B
Control cable: Atmospheric Steam Dump Valve CV-76
CV-77
CV-78
CV-79
Steam Dump Solenoid Valve
SV-85
SV-86
SV-87
SV-88
PV-1611
PV-1612
CV-100/100B
Instrumentation cable: LT-2400A
LT-2400B
LT-2400C

Train 2: Atmospheric Steam Dump Controller PC-418A
Power cable: PC-418A
Instrumentation cable: Main Steam Pressure
PT-459
PC-418A
S/G Level LT-3400A
LT-3400B
LT-3400C

Train 3: Control Cable: Reheater Isolation Valve
MOV-14
MOV-15
MOV-16
MOV-17

Equipment Required for Hot Standby (contd)

Auxiliary Feedwater (AFW):

Train 1: Power cable: Discharge valve MOV-1202
Control cable: MOV-1202
Motor Driven Pump G-10S
Flow Control Valve FCV-2300 A,B&C
Turbine Steam Supply Control Valve CV-3201
Steam Supply Bypass Control Valve SV-2613
Steam Line Drain Valve:
SV-2619
SV-2621
SV-2615
SV-2616
SV-2617
Discharge Control Valve CV-2620

Train 2: Power Cable: CV-3110
Control Cable: Pump G10
Flow Control Valve FCV-3300 A,B&C
Water Inlet to Pump G-10
SV-2618

Component Cooling Water (CCW):

Train 1: Control cable: Pump G-15A
Heat Exchanger Outlet Valve MOV-720B

Train 2: Control cable: Pump G-15B
Heat Exchanger Outlet Valve MOV-720A
Control cable: Pump G-15C

Saltwater Cooling (SWC):

Train 1: Control cable: Pump G-13A
Train 2: Control cable: Pump G-13B

Diesel Generator (DG):

Train 1: Control cable: Control Panel C-48
Transfer Pump G-74A
G-74B
Starting Air Pressure Switch PSL-180
PSL-181
Exciter Cabinet E08

Equipment Required for Hot Standby (contd)

Diesel Generator (DG):

Train 2: Control cable: Control Panel C-40
Transfer Pump G-75A
G-75B
Starting Air Pressure Switch PSL-215
PSL-221
Exciter Cabinet E-09

Gaseous Nitrogen (GNI):

Train 2: Power cable: PORV Nitrogen Supply CV-532
Control cable: CV-532

Equipment Required for Cold Shutdown

Residual Heat Removal (RHR):

Train 1: Temperature Controller TC-601A
TC-601B
Power cable: Flow Control Valve HCV-602
Discharge Temperature TE-601A
TE-601B
Control cable: TC-601A
HCV-602
Pump G-14A
Inlet Isolation Valve MOV-813
Heat Exchanger Inlet Valve MOV-822A
Discharge Isolation Valve MOV-833
Instrumentation cable: Heat Exchanger Inlet Temperature TE-600
Heat Exchanger Discharge Temperature TE-601A
TE-601B

Train 2: Control cable: Pump G-14B
Inlet Isolation Valve MOV-814
Heat Exchanger Inlet Valve MOV-822B
Discharge Isolation Valve MOV-834

Equipment Required for Cold Shutdown (contd)

Component Cooling Water (CCW):

Train 1: Control cable: Flow Control to RHR Heat Exchanger TCV-601A
TCV-601B

High/Low Pressure Interface Equipment

Reactor Coolant System (RCS):

Train 1: Power cable: Reactor Vessel Vent Valve SV-2401
SV-2402
Pressurizer High Point Vent Valve SV-2403
SV-2404
Control cable: SV-2401
SV-2402
SV-2403
SV-2404

Train 2: Power cable: Reactor Vessel Vent Valve SV-3401
SV-3402
Pressurizer High Point Vent Valve SV-3403
SV-3404
Control cable: SV-3401
SV-3402
SV-3403
SV-3404

Volume Control and Charging (VCC):

Train 1: Power cable: Seal Water Return Isolation Valve CV-527
Letdown Containment Isolation Valve CV-525
Control cable: CV-527
CV-525

Train 2: Power cable: Seal Water Return Isolation Valve CV-528
Letdown Containment Isolation Valve CV-526
Control cable: CV-528
CV-526

Spurious Operation Equipment

Essential Electric Systems (ESS):
120V (AC): Train 2: Power cable: C09 Letdown Valve Power Supply

Reactor Coolant System (RCS):
Train 1: Control cable: Pressurizer Spray Valve
PCV-430C
PCV-430H
Pump G-2A
G-2C
Train 2: Control cable: Pump G-2B

Volume Control Charging (CVCS):
Train 1: Control cable: Letdown Containment
Isolation Valve CV-525
Instrument Cable: VCT Level
LT 2550
Train 2: Power cable: Boric Acid Supply Valve CV-334
Primary Water Makeup Valve
FCV-1102A
Boric Acid Pump Discharge
Valve FCV-1102B
Seal Water Supply Valve
FCV-1115D
FCV-1115E
FCV-1115F
RCS Excess Letdown to RHR
Isolation Valve CV-414
Control cable: Boric Acid Supply Valve CV-334
Letdown Containment
Isolation Valve CV-526
FCV-1102A
FCV-1102B
FCV-1115D
FCV-1115E
FCV-1115F
CV-414
Letdown Orifice Isolation-
Backup Valve CV-202
CV-203
CV-204
Letdown Flow to Radwaste
Valve LCV-1100A
Letdown Isolation Valve
LCV-1112
Demineralizer Bypass Valve
TCV-1105
Low Pressure Letdown Valve
PCV-1105
Test Pump G-42
Chemical Blending Control
Valves CV-406A
CV-406B

Spurious Operation Equipment (contd)

Auxiliary Feedwater (AFW):

Train 1: Control cable: Bypass Isolation MOV-1204

Containment Spray and Recirculation (CRS):

Train 1: Control cable: Refueling Water Pump G-27N
Containment Spray
Control Valve CV-82
Containment Spray Valve CV-114

Train 2: Control cable: Refueling Water Pump G-27S

Main Steam (MSS):

Train 1: Control cable: Condenser Steam Dump
Solenoid Valve SV-89
SV-90
S/G Sample Isolation Valve
SV-119
SV-120
SV-121
SV-122
SV-123
SV-124

Safety Injection (SIS):

Train 1: Control cable: Safety Injection
Recirculation Valve MOV-356

Train 2: Control cable: Safety Injection
Recirculation Valve MOV-357

Train 3: Control cable: Safety Injection
Recirculation Valve MOV-358

Alternate Shutdown Equipment

Reactor Coolant System (RCS):

Train 1: Power Cable: RCS Delta T TE-400A
TE-400C

Instrumentation cable: RCS Delta T TE-400A
TE-2400C
TE-410A
TE-412C
TE-420A
TE-420C

Alternate Shutdown Equipment (contd)

Component Cooling Water (CCW):

Train 1: Control cable: RCP Thermal Barrier
Pump G-964
Thermal Barrier Coil Return
Control Valve CV-722A
CV-722B
CV-722C

Saltwater Cooling (SWC):

Train 2: Control cable: Auxiliary Pump G-13C

Safety Injection (SIS):

Train 1: Power cable: Loop B Discharge Valve MOV-850B
Control cable: MOV-850B
Pump G-50B
Return Valve Solenoid SV-528
Feed Valve Solenoid SV-530
Safety Injection Return
HV-851B
Safety Injection Feed HV-853B

Safety Injection (SIS):

Train 2: Power cable: Loop A Discharge Valve MOV-850A
Control cable: MOV-850A
Pump G-50A
Return Valve Solenoid SV-524
Feed Valve Solenoid SV-526
Safety Injection Return
HV-851A
Safety Injection Feed HV-853A

Train 3: Power cable: Loop C Discharge Valve MOV-850C
Control cable: MOV-850C

Main Feedwater (FWS):

Train 1: Control cable: Main Pump G-3B
Outlet Valve Solenoid SV-529
Inlet Valve Solenoid SV-531
Outlet Isolation HV-852B
Inlet Isolation HV-854B

Train 2: Control cable: Main Pump G-3A
Outlet Valve Solenoid SV-525
Inlet Valve Solenoid SV-527
Outlet Isolation HV-852A
Inlet Isolation HV-854A

Dedicated Shutdown Equipment

Essential Electrical Systems (EES):

Control cable: 220KV Offsite, Power Circuit Breaker POS 1 PCB #1
Breaker POS 1 PCB #2
Breaker POS 3 PCB #5
Breaker POS 3 PCB #6

Post Accident Sampling System (PAS):

Train J: Control cable: Reactor Coolant Inlet Isolation Valve CV-2023

Reactor Cycle Sampling System (RSS):

Train 1: Power cable: PAS Reactor Coolant Loop C Sample Valve CV-956
Train J: Control Cable: RCS Sample Supply Isolation Valve SV-3302

Safety Related Equipment Not Required for Safe Shutdown

Volume Control and Charging (VCC):

Train 2: Power Cable: CV-304
CV-305
Control cable: CV-305

Associated Instrumentation and Controls:
- Reactor Coolant System
- Volume Control and Charging System
- Safety Injection
- Main Steam
- Auxiliary Feedwater
- Main Feedwater
- Residual Heat Removal
- Component Cooling Water
- Saltwater Cooling
- Instrument Air
- Reactor Cavity Cooling
- Essential Electric Systems

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-B, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for train 1 and 2 4160V, 480V and 120V electrical system may occur. Operator action will be taken to trip offsite power prior to exiting the control room. Dedicated shutdown system equipment and cables are located outside this area and will remain available.

RCS Damage to cabling for block valves and PORVs may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious actuation of the PORV, until operator action is taken to deenergize

Effects of Fire on Hot Standby Capability (contd)

and close the valves has been evaluated and determined to be acceptable. Cables for the solenoid operator provided for dedicated shutdown system operation from panel C-38 are routed outside this fire area and will remain available.

Damage to cabling for pressurizer heaters Group A, B, C and D may occur. Operator action will be taken to transfer control of the required portion of pressurizer heater group D to the dedicated shutdown panel. Cables for dedicated shutdown system operation of pressurizer heater group D are routed outside the fire area and will remain available.

Damage to cabling for neutron source range monitors may occur. During operation of the dedicated shutdown system, shutdown margin will be determined by sampling primary system boron concentration.

Damage to cabling for pressurizer level and pressure transmitters may occur. Instrumentation will remain available at the dedicated shutdown panel.

Damage to pressurizer pressure transmitters may occur. Spurious operation of the spray valves will not affect safe shutdown as the reactor coolant pumps are tripped. Pressurizer code safety valves will be available for over-pressure protection. PORVs will be available for system pressure control after dedicated shutdown system operation is initiated. Spurious actuation of the PORV, until operator action is taken to deenergize and close the valve, has been evaluated and determined to be acceptable.

Damage to cabling for RCS temperature indications may occur. The corresponding dedicated shutdown system instrumentation is routed outside the fire area and will remain available.

Damage to Reactor Protection System circuits may occur. A reactor scram will result since the system is fail safe.

VCC Damage to cabling for train 1 and 2 charging pump may occur. Operator action will be taken to transfer control of the train 2 charging pump to the dedicated shutdown panel. Cables for dedicated shutdown operation are located outside the fire area and will remain available. The train 2 charging pump will be deenergized by tripping offsite power prior to control room evacuation to prevent cavitation prior to alignment of RWST flow path to the pump. Interruption of seal injection and seal cooling to the reactor coolant pump seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

Damage to cabling for RWST charging isolation valves may occur. Operator action will be taken to manually align RWST suction path to initiate charging pump operation from the dedicated shutdown system.

Damage to cables for volume control tank isolation valve may cause spurious operation. Operator action to manually close the valve will be taken.

Damage to cables for volume control tank level indication may result in spurious operation of RWST charging isolation valves. Operator action to manually align the charging flow path will be taken.

Effects of Fire on Hot Standby Capability (contd)

Damage to cabling for the charging control valve may occur. Operator action will be taken to close charging flow control valve from the dedicated shutdown panel.

Damage to cabling for the charging flow control valve and flow transmitter may occur. Operator action will be taken to position control valve from the dedicated shutdown panel, as required. Equipment/cables for dedicated shutdown system operation of are located outside the fire area and will remain available.

Damage to cabling for seal injection flow control valves, pressure controller valves and associated indication cabling may occur. Operator action will be taken to fail seal injection flow valves open, verify seal water supply valves closed, and control seal injection flow using manual valve located upstream of charging flow control valve. Interruption of seal injection and seal cooling to the reactor coolant pump seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

MSS Damage to cabling for atmospheric steam dump valves, pressure transmitter, and steam dump controller may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious operation of the steam dump valves until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

Damage to cabling for S/G level transmitters may occur. The corresponding dedicated shutdown system instrumentation is located outside this fire area and will remain available.

Damage to control cabling for reheater isolation valves may occur. Operator action will be taken to manually close these valves. Spurious actuation of these valves until operator action is performed has been evaluated and determined to be acceptable.

Damage to cabling for turbine stop valve actuators may occur. Operator action will be taken to trip the turbine at the turbine stand. Spurious operation of these valves until operator action is taken to manually trip the turbine has been evaluated and determined to be acceptable.

Damage to control cabling for steam generator blowdown control valves may occur. Operator action will be taken to close manual valves upstream of. Spurious actuation of the valve, until operator action is taken has been evaluated and determined to be acceptable.

AFW Damage to cabling for auxiliary feedwater pumps and associated valves may occur. The dedicated auxiliary feedwater pump and its associated cabling is routed outside this fire area and will remain available. Loss of auxiliary feedwater flow until operator action is taken to initiate auxiliary feedwater flow from the dedicated shutdown system has been evaluated and determined to be acceptable. Operator action will be taken to isolate instrument air and manually position auxiliary flow control valves.

Effects of Fire on Hot Standby Capability (contd)

CCW Damage to cabling for CCW pumps may occur. Component cooling water is not required for dedicated shutdown system operation. Interruption of seal cooling and seal injection to the reactor coolant pumpseals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

Damage to cabling for CCW heat exchanger outlet valves may occur. Component cooling water is not required for dedicated shutdown system operation.

SWC Damage to cabling for SWC pumps may occur. Saltwater cooling is not required for dedicated shutdown single phase cooldown.

DG Damage to cabling for diesel generator support equipment may occur. Operator action will be taken to trip diesel generators 1 and 2. Dedicated shutdown system equipment and cabling is located outside this fire area and will remain available.

GNI Damage to power to PORV nitrogen supply valve may occur. Operator action will be taken to open the manual bypass for the valve to supply nitrogen for operation of the PORVs and block valves from the dedicated shutdown panel.

Effects of Fire on Cold Shutdown Capability

RHR Damage to cabling for RHR pumps and associated valves and instrumentation may occur. The dedicated auxiliary feedwater pump will remain available for single phase cooldown.

CCW Damage to cabling for CCS temperature control valves may occur. Component cooling water is not required to support dedicated shutdown system operation.

Effects of Fire on High/Low Pressure Interface

RCS Damage to cabling for reactor vessel vent valves and pressurizer high point vent valves may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious actuation of these valves, until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

VCC Damage to cabling for seal water return and letdown containment isolation valves may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious actuation of the seal return and letdown valves until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

Consequences of Spurious Operation

EES Damage to cabling for letdown valve power supply may cause loss of remote valve control. Charging path via RWST will remain available.

RCS Damage for cabling of reactor coolant pumps may cause spurious actuation of the pumps. The RCPs will be tripped as a result of the reactor trip.

Damage to cabling for pressurizer auxiliary spray valves may occur. No mitigation is required as the reactor coolant pumps will be tripped.

VCC Damage to cabling for letdown demineralizer isolation valve may cause spurious operation of the valve. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious actuation of this valve until operator action is taken to deenergize and close the valve has been evaluated and determined to be acceptable.

Damage to cabling for G8B low VCT Level Trip could trip the pump. Dedicated shutdown system power to G8A can be utilized.

Damage to cabling for letdown containment and chemical blending valves may cause spurious operation of the valves. Operator action will be taken to close manual valve located downstream of charging flow control valve.

Damage to cabling for primary water makeup and boric acid pump discharge valves may cause spurious operation of the valves. Operator action will be taken to deenergize power and to close manual valve located downstream of makeup valve to prevent/mitigate spurious operation. Spurious actuation of this valve until operator action is taken to deenergize and close the valve has been evaluated and determined to be acceptable.

Damage to cabling for seal water supply valves may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. These valves will fail closed on loss of power. Redundant valves will remain available for seal injection.

Damage to cabling for charging system test may cause spurious operation of these components. Operator action will be taken to trip offsite/diesel generator power to deenergize the pump.

Damage to cabling for the letdown valves may cause spurious operation. Charging path via RWST will remain available.

AFW Damage to cabling for auxiliary feedwater bypass valve may cause spurious operation of the valve. The west (dedicated) auxiliary feedwater pump will remain available.

CRS Spurious operation of refueling water pumps may occur. Operator action will be taken to trip offsite/diesel generator power to deenergize these pumps.

Consequences of Spurious Operation (contd)

Damage to containment spray valves may cause spurious operation of the valves. Operator action will be taken to close manual valve located upstream.

MSS Damage to control of condenser steam dump solenoid valves and steam generator sample isolation valves may cause spurious operation of the valves. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious actuation of the condenser dump valves until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

SIS Spurious operation of safety injection recirculation valves may occur. Spurious actuation of this valve will divert flow from the seal injection flowpath to the charging safety injection flowpath. The effects of the spurious actuation have been evaluated and determined to be acceptable.

Effects of Fire on Alternate Shutdown Equipment

RCS Damage to cabling for RCS temperature indications may occur. The corresponding instrumentation on the dedicated shutdown panel routed outside of this fire area will remain available.

CCW Damage to cabling for thermal barrier pump and associated valves may occur. Component cooling water is not required for dedicated shutdown system operation.

SWC Damage to cabling for auxiliary saltwater cooling pump may occur. This pump is not required to support dedicated shutdown system operation.

SIS Damage to cabling for safety injection pumps and associated valves may occur. Operator action will be taken to trip offsite/diesel generator power to deenergize the safety injection and main feedwater pumps.

FWS Damage to cabling for the main feedwater pumps and associated valves may occur. This will not impact safe shutdown since the main feedwater pumps are tripped.

Effects of Fire on Dedicated Shutdown Equipment

EES Damage to cabling for offsite power circuit breaker may occur. Operator action credited to trip offsite power prior to evacuating the control room.

PAS Damage to cabling for reactor coolant inlet isolation valve may occur. Operator action will be taken to manually open the valve as required to enable sampling of primary system boron concentration via pneumatic override capability provided by backup nitrogen supply for PASS.

Damage to cabling for reactor coolant system loop C sample and sample supply isolation valves may occur. Operator action will be taken to open valves as required to enable sampling of primary system boron concentration.

Conclusion

The ionization smoke detectors installed in the Control Room Complex provide localized coverage of fire hazards in this fire area. These detectors provide adequate, early warning alarm to the ESO and control rooms. Manual/portable fire fighting equipment is provided in this area and also within adjacent fire areas/zones. The walls and floor forming the boundary of this area are three hour rated. The roof is non-rated concrete with an approximate thickness of 7-1/2 inches. The doors communication with other areas/zones are three hour rated and the ventilation ducts are provided with three hour rated fire dampers. The design basis fire is postulated to be approximately one hour in duration and reach a maximum temperature of 1700°F. The postulated design basis fire does not consider the fire protection features discussed above, and therefore is very conservative. In addition, the control room is continuously manned thus ensuring rapid detection of a fire. The fire protection features provided in this area are expected to adequately mitigate the consequences of the fire and confine it to this zone.

The dedicated safe shutdown system is credited for this fire area. The NRC has reviewed and approved the dedicated safe shutdown system for this area. The dedicated equipment and instrumentation credited for a fire in this zone have been evaluated to remain available for safe shutdown due to the fire barriers created and the spacing separation. An exemption from the requirements of 10CFR 50 Appendix R, Section III.G.3 has been granted for partial area detection and lack of suppression.

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FIRE AREA/ZONE: 1-PB-14-25

AREA: 33 sq.ft. **DESCRIPTION:** WEST CABLE SHAFT

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	698 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	270615 BTU's/sq.ft.
Fire Loading - Max Permissible	240000 BTU's/sq.ft. (SEE TEXT.)
Heat Rate (degrees F)	E/1950
Fire Duration	3.38 hrs.

FIRE PROTECTION (AVAILABLE)

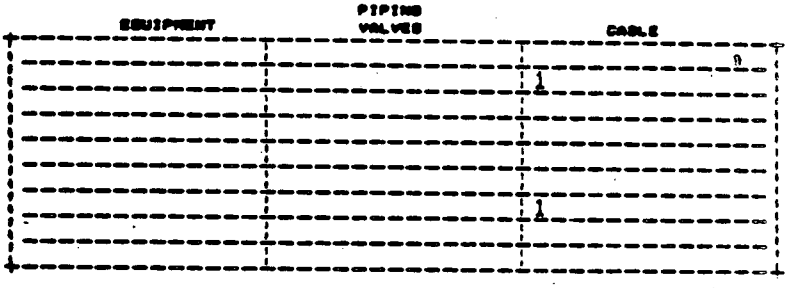
Suppression (Type)	none
Hose Stations	none, (2) in 9A
Portable Extinguishers	none, (2)10B:C in 8, (1)8B:C in 8, #
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr/8, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	MH/9A
- Penetrations	C, NC/9A
- Doors(UL Class/Zone #)	A/8

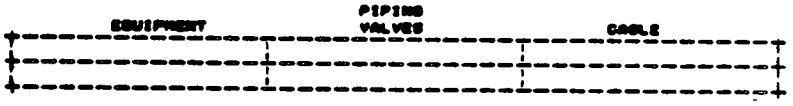
HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation



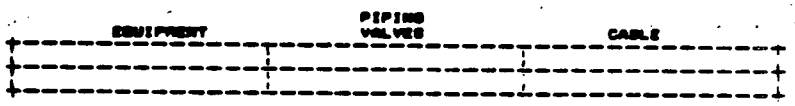
COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)



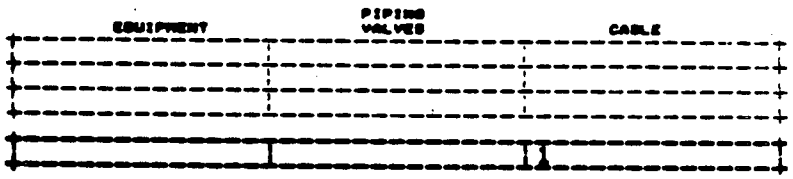
ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling



DEDICATED SHUTDOWN SYSTEMS

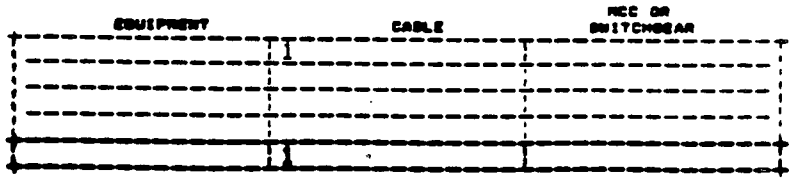
Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)



SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)



SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

NOTES

-(1)2A:40B:C,(1)3A:80B:C in 8

FIRE AREA/ZONE 1-PB-14-25

Location

Power Block - El. 14'-0" - West Cable Shaft - 33 square feet - Fig. 8-A.

Combustible Material	Quantity
Cable insulation	698 lbs

Fire loading - 270,615 Btu/sq ft (Note 2)
Maximum permissible fire loading - 240,000 Btu/sq ft
Heat Rate - E/1950 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The fire loading shown above is distorted because this zone is a vertical cable chase with a very small floor area relative to its height. If this zone were horizontal, it would have a maximum fire loading of 80,000 Btu/sq. ft., with a one hour fire resistance requirement.

The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1950 °F and would involve cable insulation.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

No automatic or manual fire fighting equipment is provided within the area. An ionization detector, located within the area, provides early warning alarm in the ESO office and control room. Manual fire fighting equipment is available in adjacent area zones 1-PB-14-8 and 1-TB-8-9A.

Construction

The north wall of the area, separating the area from the 4160V switchgear room (1-PB-14-8), is 3 hour rated. The remaining walls and roof of the area are non-rated reinforced concrete with an approximate thickness of 18 inches. A 3 hour rated door in the north wall opens to the 4160V switchgear room. There are no ventilation duct penetrations.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC): Train 1: Control cable: Bus 1C

Volume Control and Charging (VCC):

Train 1: Control cable: Charging Flow Control Valve FCV-1112

Diesel Generator (DG):

Train 1: Power cable: Standby Pump G-76
Control cable: G-76
Control Panel C-48
Oil Transfer Pump G-74A
G-74B
Air Start Pressure Switch PSL-180
PSL-181
Exciter Cabinet E08
Standby Pump G-76

Equipment Required for Cold Shutdown

None

Equipment Required for High/Low Pressure Interface

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

Essential Electrical Systems (ESS):

220kV(AC): Offsite Power Circuit Breaker Pos. 1 PCB#1
Pos. 1 PCB#2
Pos. 3 PCB#5
Pos. 3 PCB#6

Safety-Related Equipment Not Required for Safe Shutdown

Main Feedwater System (FWS):

Train 1: Control cable: FCV-456
FCV-457
FCV-458

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capabilities

EES Damage to train 1 4160V electrical system cabling may occur. The train 2 electrical system will remain available for shutdown.

VCC Damage to cabling for charging flow control valve may occur. Operator action to close manual valve located upstream will be required for charging through the seal injection flowpath.

DG Damage to cabling for train 1 diesel generator equipment may occur. Equipment and cabling for the train 2 diesel generator is located outside the fire area and will remain available.

Effects of Fire on Cold Shutdown Equipment

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Capability

None

Effects of Fire on Dedicated Shutdown Capability

EES Damage to cabling for offsite power circuit breakers may occur. No mitigation is required for a loss of offsite power as the normal shutdown systems will remain available.

Conclusion

The ionization smoke detector installed provides coverage of the hazard in this fire zone and provides adequate early fire detection and alarms in the ESO office and control room. Manual fire fighting equipment is provided in adjacent fire areas/zones. The walls forming the boundary of this zone are

Conclusions (contd)

3 hour rated and/or non-rated reinforced concrete. The fire loading shown presents a distorted view of the combustible loading because this area is a vertical cable chase with a very small floor area relative to its height. The metal hatch at the top of the zone has been evaluated and determined capable of withstanding the effects of the postulated design basis fire. The postulated design basis fire does not consider the fire protection features discussed above, and therefore is conservative. The fire protection features are expected to adequately mitigate the consequences of fire and confine it to the zone under consideration.

Normal shutdown is credited for a fire in this zone. The equipment credited for safe shutdown for a fire in this zone has been evaluated to remain available for safe shutdown due to the fire barriers and spacing separation. This fire zone meets the requirements of 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-PB-14-26

AREA: 29 sq.ft. **DESCRIPTION:** EAST CABLE SHAFT

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	176 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	77796 BTU's/sq.ft.
Fire Loading - Max Permissible	80000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1725
Fire Duration	0.97 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (2) in 9A
Portable Extinguishers	none, (1)8B:C in 8, (2)10B:C in 8, #
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr/8, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	none
- Penetrations	C
- Doors(UL Class/Zone #)	A/8

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		1	
480 V (AC)		1	
120 V (AC)			
125 V (DC)			
SUMMARY		1	

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

NOTES

(1)2A:40B:C,(1)3A:80B:C in 8

FIRE AREA/ZONE 1-PB-14-26

Location

Power Block - El. 14'-0" - East Cable Shaft - 29 square feet - Fig. 8-A.

Combustible Material	Quantity
Cable insulation	176 lbs

Fire loading - 77,796 Btu/sq ft
Maximum permissible fire loading - 80,000 Btu/sq ft
Heat Rate - E/1725 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1725 °F and would involve cable insulation.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

No automatic or manual fire fighting equipment is provided within the area. An ionization detector, located within the area, provides early warning alarm in the ESO office and control room. Manual fire fighting equipment is available in adjacent areas 1-PB-14-8 and 1-TB-8-9A.

Construction

The north wall of the area, separating the area from the 4160V switchgear room (1-PB-14-8) is 3 hour rated. The remaining walls and roof of the area are non-rated reinforced concrete with an approximate thickness of 18 inches. A 3 hour rated door in the north wall opens to the 4160V switchgear room (1-PB-14-8). There are no ventilation duct penetrations.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC):	Train 1:	Power cable:	Bus 1C
480V (AC):	Train 1:	Power cable:	MCC-3B

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for the train 1 4160V and 480V electrical systems may occur. Train 2 electrical distribution systems are located outside the fire area and will remain available.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusion

The ionization smoke detector installed provides coverage of the hazard in this fire area and should provide adequate early fire detection and alarms in the ESO office and control room. Manual fire fighting equipment is provided in adjacent fire areas/zones. The walls forming the boundary of this zone are 3 hour rated or non-rated reinforced concrete. The fire loading shown presents a distorted view of the combustible loading because this area is a vertical cable chase with a very small floor area relative to its height. The postulated design basis fire does not consider the fire protection features discussed above, is very conservative. The fire protection features are expected to adequately mitigate the consequences of fire and confine it to the zone under consideration.

Normal shutdown is credited for a fire in this zone. The equipment credited for safe shutdown for a fire in this zone has been evaluated to remain available for safe shutdown due to the fire barriers and spacing separation. This fire zone meets the requirements of 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: J-PB-20-29

AREA: 183 sq.ft. **DESCRIPTION:** NORTH STAIRWELL

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	6 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	568 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	B/150
Fire Duration	0.01 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	(1), (1) in 16
Portable Extinguishers	(1)10B:C,(1)10B:C in 11A,(1)80B:C in 11A,#
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr/16, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	none
- Penetrations	C, NC/11D,ext., ND/30A
- Doors(UL Class/Zone #)	(2)A/16, B/11C, A/11A

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

NOTES

#(1)4A:40B:C in 11C,(1)10B:C in 11C
(1)10B:C in 30B,(1)2A:60B:C in 16

FIRE AREA/ZONE: 1-PB-42-30A

AREA: 494 sq.ft. **DESCRIPTION:** CHEMICAL CONTROL LABORATORY

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	388 lbs.
Charcoal	0 lbs.
Plastics	80 lbs.
Miscellaneous	69 lbs.
Miscellaneous Gases	28 lbs.

DESIGN BASIS FIRE

Fire Loading	11146 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1200
Fire Duration	0.14 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none,(1) in 16
Portable Extinguishers	(1)8B:C, (1)10B:C in 30B
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr/16, HC or CB/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	DP/4A
- Penetrations	NC/11D, ND/30B,29
- Doors(UL Class/Zone #)	A/16, NR/30B

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE
		1

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

		1

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE 1-PB-42-30A

Location

Power Block - El. 42'-0" - Chemical Control Laboratory - 494 square feet - Fig. 8-B.

Combustible Material	Quantity
Class A combustibles	388 lbs
Plastic	80 lbs
Miscellaneous combustibles	69 lbs
Acetylene	400 cu ft
Hydrogen	191 cu ft

Fire loading - 11,146 Btu/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - E/1200 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1200° F and would involve Class A combustibles, plastic, and miscellaneous combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic fire suppression equipment is provided for this zone. An ionization detector is provided and provides early warning alarm in the ESO office and control room. Manual fire fighting equipment is provided within the zone and in adjacent areas/zones 1-PB-42-30B and 1-PB-42-16.

Construction

The wall separating this zone from the control room (1-PB-42-16) is three hour rated. All other walls are concrete block or reinforced concrete with an approximate thickness of 8". A three hour rated door communicates with the control room (1-PB-42-16) and a non-rated door communicates with Radiochemical Laboratory (1-PB-42-30B). Ventilation ducts communicating with zone/area 1-PB-42-30B and 1-PB-20-29 are not provided with rated fire dampers.

Equipment Required for Hot Standby

Main Steam System (MSS):

Train 1: Power cable: Steam Generator Blowdown Control Valve CV-100/100B
Control cable: CV-100/100B

Cold Shutdown Equipment

None

High/Low Pressure Interface Equipment

None

Spurious Operaton Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capability

Damage to cabling for steam generator blowdown control valves may occur. Operator action will be taken to close manual valves upstream. Spurious actuation until operator action taken has been evaluated and determined to be acceptable.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown

None

Conclusion

The ionization smoke detector installed provides coverage of the hazards in this fire zone and should provide adequate, early fire detection and alarm in the ESO office and control room. Manual firefighting equipment is provided in this zone and also adjacent fire area/zones. The walls forming the boundary of this zone are three hour rated on non-rated reinforced concrete. The design basis fire is postulated to be of a relatively short duration, approximately nine minutes, with a heat rate of 1200° F. The postulated design basis fire does not consider the fire protection features discussed above, and therefore is very conservative. The fire protection features are expected to adequately mitigate the consequences of fire and confine it to the zone under consideration.

Normal shutdown is credited for a fire in this zone. The equipment credited for safe shutdown for a fire in this zone has been evaluated to remain available for safe shutdown due to the fire barriers, short fire duration and spacing separation. This fire zone meets the requirements of 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-PB-42-30B

AREA: 353 sq.ft. **DESCRIPTION:** RADIOCHEMICAL LABORATORY

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	76 lbs.
Charcoal	0 lbs.
Plastics	55 lbs.
Miscellaneous	8 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	3982 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	B/350
Fire Duration	0.05 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 16, (1) in 31B
Portable Extinguishers	(1)10B:C, (1)8B:C in 30A
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	3hr/16, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	none
- Penetrations	ND/30A,exterior
- Doors(UL Class/Zone #)	NR/30A,11A

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE: 1-PB-42-31A

AREA: 310 sq.ft. **DESCRIPTION:** OFFICE

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	68 lbs.
Class A	3790 lbs.
Charcoal	0 lbs.
Plastics	92 lbs.
Miscellaneous	3 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	103169 BTU's/sq.ft.
Fire Loading - Max Permissible	120000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1750
Fire Duration	1.29 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 31B
Portable Extinguishers	(1)4A:40B:C, (1)10B:C in 16
Detectors (Type)	infrared, ionization

FIRE RESISTANCE RATING

- Walls	3hr/16, NR/31B, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	OP/31B
- Penetrations	D, ND/31B
- Doors(UL Class/Zone #)	B/31B

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE: 1-PB-20-31B

AREA: 664 sq.ft. **DESCRIPTION:** STAIRWELL/LOCKER ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	1581 lbs.
Charcoal	0 lbs.
Plastics	40 lbs.
Miscellaneous	10 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	20113 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	B/650
Fire Duration	0.25 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	(1), (1) in 11A
Portable Extinguishers	(1)10B:C, (1)4A:40B:C
Detectors (Type)	ionization (local)

FIRE RESISTANCE RATING

- Walls	3hr/16, 1hr/13A, NR/31A, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	OP/31A, OP/11B
- Penetrations	D, ND/11B, ND/31A, NC/11B
- Doors(UL Class/Zone #)	B/12,11B, A/16, C/9B,31A

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

FIRE AREA/ZONE: 1-PB-56-33

AREA: 8452 sq.ft. **DESCRIPTION:** POWER BLOCK ROOF

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	0 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	N/A
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 9B
Portable Extinguishers	(1)4A:40B:C adjacent to 15
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	none
- Floors,Ceiling or Roof	HC
- Fixed Openings	none
- Penetrations	ND/16
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant		1,2
Volume Control & Charging		
Main Steam		2
Auxiliary Feedwater		1,2
Component Cooling Water		
Saltwater Cooling		
Diesel Generator		2
Gaseous Nitrogen		
Containment Ventilation		

COLD SHUTDOWN SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal		
Component Cooling Wtr (to RHR)		

ALTERNATE SHUTDOWN SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)		
Auxiliary Saltwater Cooling		

DEDICATED SHUTDOWN SYSTEMS

EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant		J
West Auxiliary Feedwater		
Post Accident Sampling(PAS/RSS)		J
SUMMARY		1,2,J

ESSENTIAL ELECTRIC SYSTEMS

EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		
480 V (AC)		
120 V (AC)	2	
125 V (DC)		
SUMMARY	2	

SHUTDOWN SYSTEM CREDITED :Alternate:RCS Instrumentation

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :Yes(SEE TEXT)
Spurious Operation :No

FIRE AREA ZONE 1-PB-56-33

Location

Power Block - El. 56'-0" - Roof - 8452 square feet, Fig. 8-B.

Combustible Material	Quantity
NIL	

Fire loading - NIL
Maximum Permissible fire loading - 5,000 Btu/sq ft
Heat Rate - N/A

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area. The maximum credible fire is postulated to involve transient combustible materials.

Fire Protection Equipment

No automatic firefighting or detection equipment is provided within the zone. A portable fire extinguisher is available on the power block roof for manual fire fighting capability. Additional manual fire fighting capability is available from the fire department portable equipment.

Construction

This fire area consists of the power block roof at elevation 56'-0", and is located directly above the control room. The roof is constructed of reinforced concrete with a minimum thickness of 7 1/2 inches. The roof slab is covered by built-up roofing on 1/2 inch insulation. This fire area is accessed via a ladder on the east side of the power block roof.

Equipment Required for Hot Standby

Essential Electric System (EES):

120V(AC):	Train 2:	Power cable:	Vital bus 5 (Y-29) Inverter 5 (YV-29)

Reactor Coolant System (RCS):

	Train 1:	Power Cable:	Neutron Source Range Monitors NE-1201 NE-1202
		Instrumentation cable:	Hot Leg Temperature: TE-2401A TE-2412A TE-2422A Pressurizer Pressure PT-430 PT-431

Equipment Required for Hot Standby (contd)

Reactor Coolant System (RCS):

			Neutron Source Range Monitors NE-1201 NE-1202
	Train 2:	Instrumentation cable:	Hot Leg Temperature TE-3402A TE-3411A TE-3421A Pressurizer Pressure PT-425

Main Steam (MSS):

	Train 2:	Instrumentation cable:	Wide Range Level: LT-3400A LT-3400B LT-3400C

Auxiliary Feedwater (AFW):

	Train 1:	Control cable:	Flow Control Valve: FCV-2300 A,B&C Pump G10
	Train 2:	Control cable:	Flow Control Valve: FCV-3300 A,B&C Pump G-10 W Pump discharge valve FV-3110

Diesel Generator (DG):

	Train 2:	Control Cable:	Local panel C-40 Exciter cabinet E-09

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface

Reactor Coolant System (RCS):

Train 2: Control cable: Reactor Vessel Vent Valve
SV-3401
SV-3402
Pressurizer High Point Vent
Valve SV-3403
SV-3404

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

Post Accident Sampling System (PAS):

Control cable: Reactor Coolant Inlet
Isolation Valve CV-2023

Reactor Cycle Sampling System (RSS):

Control cable: RCS Sample Isolation Valve:
SV-3302

Safety-Related Equipment Not Required For Safe Shutdown

None

Technical Specification Barriers

For area/zone of the barriers requiring surveillance per Technical Specification refer to Figure 8A Sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for 120V electrical system may occur. Operator action will be taken to manually position AFW flow control valves. Redundant instrumentation will remain available for RCS temperature and steam generator level indication.

RCS Damage to instrumentation cabling for train 1 and 2 the hot leg temperature may occur. No mitigation is required since the dedicated shutdown panel which is located outside this fire area and will remain available. In addition the differential temperature indication from delta T instruments will remain available in the control room.

Effects of Fire on Hot Standby Capability (contd)

Damage to cabling for train 2 pressurizer pressure transmitter may occur. No mitigation is required since pressurizer pressure indication will remain available at the dedicated shutdown panel.

Damage to train 1 neutron source range monitors may occur. Manual action will be taken to sample primary system boron concentration to determine shutdown margin.

Damage to cabling for train 1 pressurizer pressure transmitters may occur resulting in spurious operation of PORV. Cabling for block valve is located outside the fire area and will remain available to mitigate spurious operation. Spurious operation of pressurizer heater groups A and B and pressurizer spray valves may also occur. Spurious operation of pressurizer heater groups A and B can be mitigated by tripping the heater from the control room. Pressurizer heater groups C and D will remain available. Spurious operation of the pressurizer spray valves will not affect safe shutdown, as the reactor coolant pumps are tripped.

MSS Damage to cabling for steam generator level transmitters may occur. No mitigation is required since redundant level transmitters are located outside the fire area and will remain available.

AFW Damage to cabling for train 1 and 2 steam generator flow control valves may occur. Operator action will be taken to isolate instrument air and manually position the valves.

Damage to cabling for turbine driven and Train 2 motor driven AFW pump may occur. The Train 1 motor driven auxiliary feedwater pump and associated valves are located outside the fire area and will remain available.

DG Damage to cabling for train 2 diesel generator local panel and exciter cabinet may occur. Train 1 diesel generator systems are located outside the fire area will remain available.

Effect of Fire on Cold Shutdown Capability

None

Effect of Fire on High/Low Pressure Interface

RCS Damage to cabling for reactor vessel vent valves and pressurizer high point vent valves may occur. Disconnect switches in the penetration area will be operated to close the valves. Spurious actuation of the vent valves, until operator action is taken to deenergize and close the valves has been evaluated and determined to be acceptable.

Consequences of Spurious Operation

None

Effect of Fire on Alternate Shutdown Equipment

None

Effect of Fire on the Dedicated Shutdown Equipment

PAS Damage to control cabling for reactor coolant inlet isolation valve may occur but will have no effect on safe shutdown since alternative means to determine shutdown margin is available through manual positioning of PASS and RSS valves.

RSS Damage to control cabling for RCS sample isolation valve may occur but will have no effect on safe shutdown since the alternative means to determine shutdown margin is available through manual positioning of PASS and RSS valves.

Conclusion

The portable fire extinguisher on the power block roof provides fire suppression capability for the area. A fire in this area would also be controlled by the use of mobile firefighting apparatus utilizing hose streams and capable of discharging a combined flow of 2500 gpm to a potential fire. The hose station at the turbine stand by the stairs is also available. Due to the area's configuration, open to the atmosphere, and no transient combustibles are expected due to remote location. Heat and the products of combustion produced by a fire in this area would dissipate into the open atmosphere. The postulated design basis fire does not consider the fire protection features discussed above, and therefore, is very conservative. The fire protection features are expected to adequately mitigate the consequences of fire and confine it to the area under consideration.

Alternate shutdown equipment is also credited for a fire in this area. The normal safe shutdown equipment credited for a fire in this area has been evaluated to remain available for operation due to the spacing separation and remote location of the area in accordance with Appendix R, Section III.G.1. An exemption to the requirements of 10CFR50 Appendix R, Section III.G.3 has been granted for lack of detection and suppression.

UNIT 1 DIESEL GENERATOR BUILDING

The Unit 1 Diesel Generator Building is a reinforced concrete structure which contains the diesel generators and support equipment. The Diesel Generator Building is divided into seven fire areas. Fire areas containing redundant equipment are separated by fire resistant barriers.

The Diesel Generator Building contains components and/or cabling for the following systems, which can be used to achieve, maintain, or support safe shutdown:

- Diesel Generator
- Essential Electric
- Volume Control and Charging
- Safety Injection
- Gaseous Nitrogen
- Reactor Cycle Sampling

The types of fire suppression/detection equipment in or near the building consist of the following:

- Portable extinguishers.
- Pre-action sprinkler systems.
- Ionization and infrared detectors, which activate the pre-action sprinkler valve and provide early warning alarm.
- Manual hose stations.

Fire Area/Zone	Contains Safe Shutdown Equipment	Contains Safety Related Equipment Not Required for Safe Shutdown	Page No.	Figure No.
1-DG-20-17A	Yes	Yes	1/DG-1	8-D
1-DG-20-17B	Yes	No	1/DG-8	8-D
1-DG-20-18	Yes	Yes	1/DG-13	8-D
1-DG-13-19	Yes	No	1/DG-19	8-D
1-DG-13-20	Yes	No	1/DG-23	8-D
1-DG-20-21	Yes	No	1/DG-27	8-D
1-DG-20-22	Yes	No	1/DG-31	8-D
1-DG-2-32	No	No	1/DG-36	8-D

FIRE AREA/ZONE: 1-DG-20-17A

AREA: 2501 sq.ft. **DESCRIPTION:** NORTH DIESEL GENERATOR ROOM

COMBUSTIBLES

Oil & Grease	20107 lbs.
Cable (30% Fill)	1346 lbs.
Class A	10 lbs.
Charcoal	0 lbs.
Plastics	10 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	154587 BTU's/sq.ft.
Fire Loading - Max Permissible	160000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1900
Fire Duration	1.93 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	pre-action sprinklers
Hose Stations	(1), hydrants on fire main
Portable Extinguishers	(3)10B:C, (1)4A:40B:C, (1)4A:40B:C in 17B
Detectors (Type)	ionization, infrared

FIRE RESISTANCE RATING

- Walls	3hr/18, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	DP/17B, LV/4J
- Penetrations	P,C, NP/17B,4J
- Doors(UL Class/Zone #)	NR/17B, (2)NR/4J

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			2
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator	2	2	2
Gaseous Nitrogen			2
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			(1,2,3)
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			J

SUMMARY

EQUIPMENT	PIPING VALVES	CABLE
2	2	2,(1,2,3),J

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)		1 or 2	2
120 V (AC)			
125 V (DC)	2	1 or 2	

SUMMARY

EQUIPMENT	CABLE	MCC OR SWITCHGEAR
2	1 2	2

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :yes(SEE TEXT)

FIRE AREA/ZONE 1-DG-20-17A

Location

Diesel Generator Building - El. 20'-6" - North Diesel Generator Room - 2501 square feet - Fig. 8-D.

Combustible Material	Quantity
Fuel oil	4,087 lbs
Lubricating oil	16,020 lbs
Cable insulation	1,346 lbs
Class A combustibles	10 lbs
Plastic	10 lbs

Fire loading - 154,587 Btu/sq ft
Maximum permissible fire loading - 160,000 Btu/sq ft
Heat Rate - E/1900 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1900 °F and would involve oil, cable insulation, Class A combustibles, and plastic.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

The zone contains an automatic pre-action sprinkler system. The pre-action valve will operate upon alarm of at least one of the ionization or one of the infrared flame detectors located in the zone. Actuation of the detector provides early warning alarm in the ESO office and the control room. Manual fire fighting equipment is available within the zone and in adjacent zone 1-DG-20-17B. In addition, hose streams are available from yard hydrants.

Construction

The wall adjoining the south diesel generator room (1-DG-20-18) is 3 hour rated. The walls common with the battery room (1-DG-20-17B) are nonrated

Construction (contd.)

reinforced concrete construction with a minimum thickness of 12 inches. The ceiling of the battery room (1-DG-20-17B) is reinforced concrete with an approximate thickness of 9 inches. The roof and the remainder of the zone walls are nonrated, reinforced concrete construction with an approximate thickness of 18 inches. Two nonrated doors open to the area from the yard area (1-YD-14-4J). One nonrated door separates the zone from the battery room (1-DG-20-17B). Louvered ventilation openings and exhaust fans provide communication with the exterior. There are no ventilation duct penetrations.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC):	Train 2:	Power cable: Bus 2C
		Control cable: Bus 2C
480V (AC):	Train 2:	Motor Control Center 4B
		Power cable: MCC-4B
120V (AC):	Train 2:	Power cable: Inverter 5 (YV29)
125V (DC):	Train 2:	Battery Charger C (D09)
		Battery Charger D (D10)
		DC Bus 2 (D08)
		Power cable: D08
		D09
		D10
		Battery 2 (D11)

Volume Control and Charging (VCC):

Train 2: Power Cable: Charging Pump G-8A

Diesel Generator Systems (DG):

Train 2: Diesel Generator No. 2
Diesel Generator Local Panel C-40
Power Cable: C-40
Control Cable: C-40
Fuel Oil: Day Tank D-19
Filter C-23A
C-23B
Pump G-54
Standby Pump G-62
Level Switch LSH/L/LL 97B
LSH/L/LL 97D
Pressure Switch PSL-314
Power cable: Pump G-75A
G-75B
G-62
Control cable: G-75A
G-75B
G-62
Piping and valves

Equipment Required for Hot Standby (contd)

Diesel Generator Systems (DG):

Train 2: Lube Oil: Sump Tank D-10
Cooler E-16
Pump G-68
Standby Pump G-70
Filters C-26A
C-26B
Strainer C-28
Control Valve TCV-1676
TCV-1674
Power cable: G-70
Control cable: G-70
Piping and valves

Cooling Water: Jacket Water Standpipe D-6
Pump G-18
Expansion Tank D-28
Power cable: Fan A-14A
A-14B
A-14C
A-14D
Control cable: A-14A
A-14B
A-14C
A-14D
Instrumentation cable: A-14A
Piping and valves

Combustion Air: Turbocharger K-902
K-903
K-904
K-905
Intake Filter C-908
C-909
Air Intake Silencer C-911
C-912
Aftercooler E-902
E-903
E-904
E-905
Control Valve PV/PY-153
PV/PY-154
PV/PY-155
PV/PY-156
Exhaust Vacuum Fan A-16A
A-16B
Power Cable: A-16A
A-16B

Equipment Required for Hot Standby (contd)

Diesel Generator Systems (DG):

Train 2: Combustion Air (contd):
Control cable: A-16A
A-16B
Piping and valves
Starting Air: Storage Tank C-14A
C-14B
Inlet Solenoid SV-401
SV-402
SV-404
SV-405
Pressure Switch PSL-215
PSL-221
Flow Control Valve FV-120
FV-121
Control cable: SV-401
SV-402
SV-404
SV-405
PSL-215
PSL-221
Piping and valves
Exciter Cabinet E-07
E-09
Power cable: E-09
Control cable: E-09

Gaseous Nitrogen (GNI):

Train 2: Power cable: PORV Nitrogen Supply Control Valve
CV-532

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

Safety Injection (SIS):

Train 1: Control cable: Safety Injection Discharge Valve MOV-850B

Train 2: Control cable: Safety Injection Discharge Valve MOV-850A

Train 3: Control cable: Safety Injection Discharge Valve MOV-850C

Dedicated Shutdown Equipment

Reactor Cycle Sampling System (RSS):

Train J: Power cable: RCS Sample Supply Isolation Valve SV-3302

Safety Related Equipment Not Required for Safe Shutdown

Reactor Coolant System:

Train 2: Control cable: CV-992

Diesel Generator System:

Train 2: Diesel Generator Local Panel C-45

Essential Electric Systems:

125V (DC) Train 2: Control cable: 480V Switchgear 4

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-D, Sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for the train 2 essential electric power systems may occur. The train 1 essential electric system and its associated cabling are located outside this fire zone and will remain available.

VCC Damage to cabling for the train 2 charging pump may occur. The train 1 pump and its associated cables are located outside this fire zone and will remain available.

Effects of Fire on Hot Standby Capability (contd)

DG Loss of the train 2 diesel generator systems may occur. The train 1 diesel generator systems are located outside this fire zone and will remain available.

GNI Damage to cabling for the PORV nitrogen supply control valve may occur. Operator action to open the manual bypass valve will be taken to provide nitrogen if PORV or block valve operation is required.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

SIS Damage to cabling for the safety injection discharge valves may occur. Use of this equipment is not credited for shutdown in this fire area.

Effects of Fire on Dedicated Shutdown Equipment

RSS Damage to cabling for the RCS sample supply isolation valve may occur. The source range neutron flux monitor will remain available for determination of safe shutdown margin.

Conclusions

The fire detection and suppression systems provide adequate coverage for this zone. These systems provide early warning alarm in the ESO office and control room, while actuating the valve for the suppression system. The nonrated walls of the zone are concrete construction with a minimum thickness of 9 inches. Nonrated penetrations communicate with the outside east yard area where strict administrative housekeeping control prevents the storage of combustible materials in the vicinity. The fire protection features will adequately mitigate the consequences of the fire and confine it to the zone under consideration.

The safe shutdown equipment and instrumentation required for safe shutdown for a fire in this zone should remain available due to the fire barriers provided and spatial separation. This zone complies with the requirements of 10CRF50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-DG-20-17B

AREA: 194 sq.ft. **DESCRIPTION:** BATTERY ROOM NO. 2

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	251 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	260 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	42508 BTU's/sq.ft.
Fire Loading - Max Permissible	80000 BTU's/sq.ft.
Heat Rate (degrees F)	C/1250
Fire Duration	0.53 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 17A
Portable Extinguishers	(1) 4A:40B:C, (2)10B:C in 17A
Detectors (Type)	infrared

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	LV/exterior, OP/17A
- Penetrations	C,P, NP/17A
- Doors(UL Class/Zone #)	NR/17A I

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			2
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			2
Gaseous Nitrogen			2
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			(1,2,3)
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			J

SUMMARY

			2,(1,2,3),J

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		2	
480 V (AC)			
120 V (AC)			
125 V (DC)	2	2	
SUMMARY	2	2	

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :yes(SEE TEXT)

FIRE AREA/ZONE 1-DG-20-17B

Location

Diesel Generator Building - El. 20'-6" - Battery Room No. 2 - 194 square feet - Fig. 8-D.

Combustible Material	Quantity
Cable insulation	251 lbs
Plastic	260 lbs

Fire loading - 42,508 Btu/sq ft
Maximum permissible fire loading - 80,000 Btu/sq ft
Heat Rate - C/1250 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1250 °F and would involve cable insulation and plastic.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

An infrared flame detector provides early warning alarm in the ESO office and the control room. Manual fire fighting equipment is available within the zone and in adjacent zone 1-DG-20-17A.

Construction

The east and south walls are of nonrated reinforced concrete construction with an approximate thickness of 12 inches. The north and west walls are nonrated reinforced concrete with an approximate thickness of 18 inches. The ceiling of the zone is reinforced concrete with an approximate thickness of 9 inches. Unsealed vent openings in the ceiling communicate with the adjacent diesel generator room (1-DG-20-17A). A nonrated door separates the zone from zone 1-DG-20-17A. Louvered ventilation openings communicate with the exterior. There are no ventilation duct penetrations.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC):	Train 2:	Control cable:	Bus 2C
125V (DC):	Train 2:	Battery 2 (D11)	
		Power cable:	D11
			D10
		DC Bus #2 D08	
		DG 2 Local Control Panel C-40	

Volume Control and Charging (VCC):

	Train 2:	Power Cable:	Charging Pump G-8A

Diesel Generator Systems (DG):

	Train 2:	Control cable:	C-40
			Pump G-62
			E09
		Power cable:	Pump G-70
Gaseous Nitrogen (GNI)	Train 2:	Power cable	DG2 Exciter E09
			PORV Nitrogen Supply
			Control Valve CV-532

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

Safety Injection (SIS):

Train 1:	Control cable:	Safety Injection Discharge Valve MOV-850B
Train 2:	Control cable:	Safety Injection Discharge Valve MOV-850A
Train 3:	Control cable:	Safety Injection Discharge Valve MOV-850C

Dedicated Shutdown Equipment

Reactor Cycle Sampling System (RSS):

Train J: Power Cable: RCS Sample Supply Isolation Valve SV-3302

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-D, Sheet 3.

Effects of Fire on Hot Standby Capability

VCC Damage to cabling for train 2 charging pump may occur. The train 1 pump and its cabling are located outside this fire area and will remain available.

DG Damage to cabling for train 2 diesel generator systems may occur. The train 1 diesel generator is located outside the fire zone and will remain available.

EES Damage to cabling for the train 2 essential electric systems may occur. The train 1 essential electric systems are located outside the fire area and will remain available.

Damage to cabling for train 1 battery charger C may occur. Backup power to vital buses 5 and 6 are located outside this fire zone and will remain available.

GNI Damage to cabling for the PORV nitrogen supply control valve may occur. Operator action to open the manual bypass valve will be taken to provide nitrogen if PORV or block valve operation is required.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

SIS Damage to cabling for the safety injection discharge valves may occur. This equipment is not credited for shutdown in this zone.

Effects of Fire on Dedicated Shutdown Equipment

RSS Damage to cabling for the RCS sample supply isolation valve may occur. This equipment is not credited for shutdown in this zone.

Conclusions

The infrared detection system is expected to detect the fire in its initial stages of growth and provide early warning alarm in the ESO office and control room. Manual fire-fighting equipment is available in adjacent zones and may be used for a fire in this zone. The walls are nonrated concrete with a minimum thickness of 12 inches. The design basis fire is insufficient to breach the fire barriers which separate the fire area from adjacent areas containing redundant safe shutdown equipment. The fire protection features should adequately mitigate the consequences of the fire and confine it to the zone under consideration.

The safe shutdown equipment and instrumentation required for safe shutdown for a fire in this zone should remain available due to the fire barriers and spatial separation. The zone complies with the requirements of 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-DG-20-18

AREA: 2695 sq.ft. DESCRIPTION: SOUTH DIESEL GENERATOR ROOM

COMBUSTIBLES

Oil & Grease	20107 lbs.
Cable (30% Fill)	819 lbs.
Class A	22 lbs.
Charcoal	0 lbs.
Plastics	5 lbs.
Miscellaneous	120 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	141846 BTU's/sq.ft.
Fire Loading - Max Permissible	160000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1800
Fire Duration	1.77 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	pre-action sprinklers
Hose Stations	(1), hydrants on fire main
Portable Extinguishers	(3)10B:C, (1)4A:40B:C
Detectors (Type)	ionization, infrared

FIRE RESISTANCE RATING

- Walls	3hr/17A, HC/others
- Floors,Ceiling or Roof	HC
- Fixed Openings	LV/4J
- Penetrations	P,C, NP/4J
- Doors(UL Class/Zone #)	(2)NR/4J

	EQUIPMENT	PIPING VALVES	CABLE
HOT STANDBY SYSTEMS			
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator	1	1	1
Gaseous Nitrogen			
Containment Ventilation			
COLD SHUTDOWN SYSTEMS			
Residual Heat Removal			
Component Cooling Wtr (to RHR)			
ALTERNATE SHUTDOWN SYSTEMS			
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			
DEDICATED SHUTDOWN SYSTEMS			
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			
SUMMARY	1	1	1

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
ESSENTIAL ELECTRIC SYSTEMS			
4160 V (AC)		1	
480 V (AC)		1	1
120 V (AC)			
125 V (DC)			
SUMMARY		1	1

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE 1-DG-20-18

Location

Diesel Generator Building - El. 20'-6" - South Diesel Generator Room - 2695 square feet - Fig. 8-D.

Combustible Material	Quantity
Fuel Oil	4,086 lbs
Lubricating oil	16,021 lbs
Cable insulation	819 lbs
Class A combustibles	22 lbs
Plastic	5 lbs
Rubber	120 lbs

Fire loading - 141,846 Btu/sq ft
Maximum permissible fire loading - 160,000 Btu/sq ft
Heat Rate - E/1800 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1800 °F and would involve oil, cable insulation, Class A combustibles, plastic, and miscellaneous combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

The area contains an automatic pre-action sprinkler system. The pre-action valve will operate upon alarm of at least one of the ionization or one of the infrared flame detectors located in the area. Actuation of the detector provides early warning alarm in the ESO office and the control room. Manual fire fighting equipment is available within the area. In addition, hose streams are available from yard hydrants.

Construction

The wall adjoining the north diesel generator room (1-DG-20-17A) is 3 hour rated. The roof and the remainder of the area walls are non-rated reinforced concrete construction with an approximate thickness of 18 inches. Two non-rated doors separate the area from the exterior. Louvered ventilation openings and exhaust fans provide communication with the exterior. There are no ventilation duct penetrations.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC): Train 1: Power cable: Bus 1C,
Control cable: Bus 1C

480V (AC): Train 1: MCC-3B
Power cable: MCC-3B

Diesel Generator Systems (DG):

Train 1: Diesel Generator No. 1
Diesel Generator Local Panel C-48
Power cable: C-48
Control cable: C-48
Fuel Oil: Day Tank D-14
Filters C-21A
C-21B
Pump G-42
Standby Pump G-76
Level Switches LSH/L/LL 97A
97C
Pressure Switch PSL-308
Power cable: Pump G-74A
G-74B
G-76
Control cable: G-74A
G-74B
G-76
Piping and valves
Lube Oil: Sump Tank D-9
Cooler E-10
Pump G-67
Standby Pump G-69
Filters C-24A
C-24B
Strainer C-27

Equipment Required for Hot Standby (contd)

Diesel Generator Systems (DG):

Train 1:
- Lube Oil:
  - Control Valve TCV-1675, TCV-1673
  - Power cable: Pump G-69
  - Control cable: G-69
  - Piping and valves
- Cooling Water:
  - Jacket Water Standpipe D-5
  - Pump G-16
  - Expansion Tank D-27
  - Power cable: Fan A-13A, A-13B, A-13C, A-13D
  - Control cable: A-13A, A-13B, A-13C, A-13D
  - Piping and valves
- Instrumentation Cable: A-13A
- Combustion Air:
  - Turbochargers K-910, K-911, K-912, K-913
  - Intake Filter C-924, C-925
  - Air Intake Silencer C-926, C-927
  - Aftercooler E-910, E-911, E-912, E-913
  - Control Valve PV/PY-113, PV/PY-114, PV/PY-115, PV/PY-116
  - Exhaust Vacuum Fan A-15A, A-15B
  - Power Cable: A-15A, A-15B
  - Control cable: A-15A, A-15B
  - Piping and valves
- Starting Air:
  - Storage Tank C-13A, C-13B
  - Inlet Solenoids SV-301, SV-302, SV-304, SV-305

Equipment Required for Hot Standby (contd)

Diesel Generator Systems (DG):

Train 1: Starting Air (contd):
- Pressure Switches PSL-180
  PSL-181
- Flow Control Valve FV-100
  FV-101
- Control cable: SV-301
  SV-302
  SV-304
  SV-305
  PSL-180
  PSL-181
- Piping and valves

Exciter Cabinet E-06
E-08

Power cable: E-08

Control cable: E-08

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

Diesel Generator System: Train 1: Diesel Generator local panel C-44

Cable: Train 1

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-D, Sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for the train 1 essential electric power system may occur. The train 2 essential electric systems are located outside the fire area and will remain available.

DG Damage to the train 1 diesel generator systems may occur. The train 2 diesel generator system is located outside the fire area and will remain available.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

The fire detection and suppression systems provide coverage in this zone. These systems provide early warning alarm in the ESO office and control room, while actuating the valve for the suppression system. The nonrated walls of the zone are concrete construction with a minimum thickness of 9 inches. Nonrated penetrations communicate with the outside east yard area where strict administrative housekeeping control prevents the storage of combustible materials in the vicinity. The fire protection features will adequately mitigate the consequences of the fire and confine it to the zone under consideration.

The safe shutdown equipment and instrumentation required for safe shutdown for a fire in this zone should remain available due to the fire barriers provided and spatial separation. This zone complies with the requirements of 10CRF50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-DG-13-19

AREA: 217 sq.ft. **DESCRIPTION:** NORTH DIESEL FUEL TRANSFER ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	0 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	N/A
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, hydrants on fire main
Portable Extinguishers	none
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	CH/4J,OP/4J
- Penetrations	P
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE
2	2	2

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

2	2	2

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

NOTES

50,000 gals. fuel oil storage tank below

FIRE AREA/ZONE 1-DG-13-19

Location

Diesel Generator Building - El. 13'-7" - North Diesel Fuel Transfer Room - 217 square feet - Fig. 8-D.

Combustible Material	Quantity
None	Nil

Fire loading - None
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - None

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

A fire is not expected to occur in this area during normal operations. The maximum credible fire is postulated to involve transient combustible materials or a leak in the fuel oil piping within the zone.

Fire Protection Equipment

Automatic fire suppression, detection, or manual firefighting equipment is not provided in the area. Hose streams are available from yard hydrants.

Construction

The area is entirely below grade. The walls defining the area are nonrated reinforced concrete with an approximate thickness of 18 inches. The area is accessed through hatches at grade level.

Equipment Required for Hot Standby

Diesel Generator Systems (DG):

Train 2: Fuel Oil Transfer Pump G-75A
G-75B
Power cable: G-75A
G-75B
Piping and valves
Diesel Fuel Oil Storage Tank D-24 (Below Area)

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-D, Sheet 3.

Effects of Fire on Hot Standby Capability

DG Damage to the train 2 diesel fuel oil system may occur. The train 1 diesel fuel oil system is located outside this fire area and will remain available.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

The lack of fire loading and the substantial construction of the concrete walls should adequately mitigate the consequences of the fire and confine it to the area under consideration.

The separation of safe shutdown equipment in this fire area from redundant safe shutdown equipment meets the requirements of Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-DG-13-20

AREA: 217 sq.ft. **DESCRIPTION:** SOUTH DIESEL FUEL TRANSFER ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	0 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	N/A
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, hydrants on fire main
Portable Extinguishers	none
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	CH/4J, OP/4J
- Penetrations	P
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator	1	1	1
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

EQUIPMENT	PIPING VALVES	CABLE
1	1	1

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			
SUMMARY			

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

NOTES

50,000 gals. fuel oil storage tank below

FIRE AREA/ZONE 1-DG-13-20

Location

Diesel Generator Building - El. 13'-7" - South Diesel Fuel Transfer Room - 217 square feet - Fig. 8-D.

Combustible Material	Quantity
None	Nil

Fire loading - None
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - None

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

A fire is not expected to occur in this area during normal operations. The maximum credible fire is postulated to involve transient combustible materials or a leak in the fuel oil piping within the zone.

Fire Protection Equipment

Automatic fire suppression, detection, or manual fire fighting equipment is not provided in the area. Hose streams are available from yard hydrants.

Construction

The area is entirely below grade. The walls defining the area are non-rated reinforced concrete with an approximate thickness of 18 inches. The area is accessed through hatches at grade level.

Equipment Required for Hot Standby

Diesel Generator Systems (DG):

Train 1: Fuel Oil Transfer Pump G-74A
G-74B
Power cable: G-74A
G-74B
Piping and valves
Fuel Oil Storage Tank D-23 (Below Area)

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-D, Sheet 3.

Effects of Fire on Hot Standby Capability

DG Damage to the train 1 diesel generator fuel transfer system may occur. The train 2 diesel generator fuel transfer system is located outside the fire area and will remain available.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

The walls of this area are nonrated concrete with a minimum thickness of 18 inches. The lack of fire loading and substantial construction of the concrete walls will adequately mitigate the consequences of the fire and confine it to the area under consideration.

The separation of safe shutdown equipment in this fire area from redundant safe shutdown equipment meets the requirements of Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-DG-20-21

AREA: 1227 sq.ft. **DESCRIPTION:** NORTH WATER-AIR HEAT EXCHANGER AREA

COMBUSTIBLES

Oil & Grease	1 lbs.
Cable (30% Fill)	14 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	72 lbs.
Miscellaneous	110 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	2604 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	B/300
Fire Duration	0.03 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 17A, hydrants on fire main
Portable Extinguishers	(1)4A:40B:C, (1)10B:C in 17A
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC/17A, NR/others
- Floors,Ceiling or Roof	HC/floor, NR/roof
- Fixed Openings	OP/4J
- Penetrations	P,C
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator	2	2	2
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

EQUIPMENT	PIPING VALVES	CABLE
2	2	2

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE 1-DG-20-21

Location

Diesel Generator Building - El. 20'-6" - North Water-Air Heat Exchanger Area - 1227 square feet - Fig. 8-D.

Combustible Material	Quantity
Cable insulation	14 lbs.
Rubber	110 lbs.
Plastic	72 lbs.
Lube Oil	1 lb.

Fire loading - 2604 Btu/sq ft
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - B/300°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: Some fixed combustibles are stored in locked steel boxes in this area and they have been derated. Their derated value is shown above.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 300°F and would involve cable insulation, rubber, plastic and lube oil.

The design basis fire is concervatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

Automatic fire suppression or detection systems are not provided in the area. Manual fire fighting equipment is available within the area and in adjacent zone 1-DG-20-17A. Hose streams are available from yard hydrants.

Construction

The south wall of the area, adjoining the north diesel generator room (1-DG-20-17A), is nonrated reinforced concrete with an approximate thickness of 18 inches. To the north, east, and west, the area is bounded at grade by fencing. The ceiling is open to the atmosphere through fixed, reinforced concrete louvers.

Equipment Required for Hot Standby

Diesel Generator Systems (DG):

Train 2:	Cooling Water:	Heat Exchanger E-7
		Fan A-14A
		A-14B
		A-14C
		A-14D

Equipment Required for Hot Standby (Contd)

Train 2: Cooling Water: Power cable: A-14A
A-14B
A-14C
A-14D
Control cable: A-14A
A-14B
A-14C
A-14D
Piping

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance, refer to Figure 8-D, Sheet 3.

Effects of Fire on Hot Standby Capability

DG Damage to the train 2 diesel generator cooling water system may occur. The train 1 diesel generator cooling water system is located outside this fire area and will remain available.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

The lack of fire loading and the construction features present should adequately mitigate the consequences of the fire and confine it to the area under consideration.

The separation of safe shutdown equipment in this fire area from redundant safe shutdown equipment meets the requirements of Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-DG-20-22

AREA: 1227 sq.ft. **DESCRIPTION:** SOUTH WATER-AIR HEAT EXCHANGER AREA

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	20 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	209 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	B/200
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 18, hydrants on fire main
Portable Extinguishers	(1)4A:40B:C, (1)10B:C in 18
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC/18, NR/others
- Floors,Ceiling or Roof	HC/floor, NR/roof
- Fixed Openings	OP/4J
- Penetrations	P,C
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator	1	1	1
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

EQUIPMENT	PIPING VALVES	CABLE
1	1	1

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)		1	
120 V (AC)			
125 V (DC)			

SUMMARY

	1	

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE 1-DG-20-22

Location

Diesel Generator Building - El. 20'-6" - South Water-Air Heat Exchanger Area - 1227 square feet - Fig. 8-D.

Combustible Material	Quantity
Cable insulation	20 lbs.

Fire loading - 209 Btu/sq. ft.
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - B/200°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 200°F and would involve cable insulation.

The design basis fire is concervatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

Automatic fire suppression or detection systems are not provided in the area. Manual fire fighting equipment is available within the area and in adjacent area 1-DG-20-18. In addition, hose streams are available from yard hydrants.

Construction

The north wall of the area, adjoining the south diesel generator room (1-DG-20-18), is nonrated reinforced concrete with an approximate thickness of 18 inches. To the south, east, and west, the area is bounded at grade by fencing. The ceiling is open to the atmosphere through fixed, reinforced concrete louvers.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC): Train 1: Control cable: Bus 1C

Equipment Required for Hot Standby (Contd)

Diesel Generator Systems (DG):

Train 1:	Control cable:	C-48	
	Cooling Water:	Heat Exchanger E-5	
		Fan A-13A	
		A-13B	
		A-13C	
		A-13D	
	Power cable:	A-13A	
		A-13B	
		A-13C	
		A-13D	
	Control cable:	A-13A	
		A-13B	
		A-13C	
		A-13D	
	Fuel Oil: Control cable:	G-74A	
		G-74B	
	Starting Air: Control cable:	Pressure switch	
		PSL-180	
		PSL-181	
	Piping		

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety-Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance per Technical Specification refer to Figure 8-D, Sheet 3.

Effects of Fire on Hot Standby Capability

DG Loss of the train 1 diesel generator systems may occur. The train 2 diesel generator systems are located outside this fire area and will remain available.

EES Damage may occur to cabling for the train 1 essential electric power system. The train 2 essential electric power system is located outside this fire area and will remain available.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

The lack of fire loading and the construction features present should adequately mitigate the consequences of the fire and confine it to the area under consideration.

The separation of safe shutdown equipment in this fire area from redundant safe shutdown equipment meets the requirements of Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-DG-2-32

AREA: 220 sq.ft. **DESCRIPTION:** DIESEL AREA SUMP

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	0 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	N/A
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, hydrants on fire main
Portable Extinguishers	none
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC, NR/roof
- Fixed Openings	M/4J, MH/4J
- Penetrations	P
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :NORMAL

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE 1-YD-20-4A

UNIT 1 YARD

The Unit 1 Yard consists of the area bounded by the containment sphere, auxiliary building, turbine building, fuel handling building, power block, ventilation equipment room, and the security fence.

The yard includes the east and west penetration areas, doghouse, circulating water pump well, condensate storage tank area and the post accident sampling system process and control compartments. The yard analysis also includes the dedicated shutdown area, health physics building, radwaste facility, maintenance building, and the surrounding yard areas to the security fence boundary.

The yard contains components and/or cabling for the following systems, which can be used to achieve, maintain, or support safe shutdown:

- Reactor Coolant
- Volume Control and Charging
- Main Steam
- Auxiliary Feedwater
- Residual Heat Removal
- Component Cooling Water
- Gaseous Nitrogen
- Containment Ventilation
- Saltwater Cooling
- Diesel Generator
- Safety Injection
- Feedwater
- Post Accident Sampling
- Reactor Cycle Sampling
- Essential Electric Systems

The types of fire suppression/detection equipment available in or near the Yard Area consists of the following:

- Portable fire extinguishers
- Manual hose stations
- Heat, ionization smoke, infrared flame, and ultraviolet detectors
- Automatic deluge water spray systems over station transformers 1, 2 and 4
- Automatic water spray system protects a portion of the area separating zones 4B and 4D.
- Cable tray fire stops on cable trays at the boundary between zones 4B and 4D.

Fire Area/Zone	Contains Safe Shutdown Equipment	Contains Safety Related Equipment Not Required for Safe Shutdown	Page No.	Figure No.
1-YD-20-4A	Yes	Yes	1/YD-1	8-A, 8-B
1-YD-20-4B	Yes	Yes	1/YD-12	8-A, 8-B
1-YD-20-4C	Yes	Yes	1/YD-25	8-A, 8-C
1-YD-14-4D	Yes	Yes	1/YD-30	8-A, 8-C
1-YD-(-7)-4E	Yes	No	1/YD-43	8-C
1-YD-14-4F	Yes	Yes	1/YD-47	8-A
1-YD-14-4G	Yes	No	1/YD-52	8-A, 8-C
1-YD-14-4H	No	No	1/YD-57	8-G
1-YD-14-4I	No	No	1/YD-58	8-G
1-YD-14-4J	No	No	1/YD-59	8-G
1-YD-14-4K	Yes	No	1/YD-60	8-G
1-YD-14-4L	No	No	1/YD-63	8-G
1-YD-7-27	Yes	No	1/YD-64	8-A
1-YD-7-28	Yes	No	1/YD-67	8-A

FIRE AREA/ZONE: 1-YD-20-4A

AREA: 1758 sq.ft. DESCRIPTION: EAST PENETRATION AREA

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	3398 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	40 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	24918 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1375
Fire Duration	0.31 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	(2)
Portable Extinguishers	(1)4A:40B:C,#
Detectors (Type)	heat,ionization,ultraviolet

FIRE RESISTANCE RATING

- Walls	3hr/8,16, 1hr/9A, NR-Steel/1, HC others
- Floors,Ceiling or Roof	no roof
- Fixed Openings	OP/4D,30A,9B,4B
- Penetrations	ND/4D NP/27 P,C
- Doors(UL Class/Zone #)	NR/11A NR/4D

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			1,2,(1)
Volume Control & Charging			2,1
Main Steam	1,3		1,2
Auxiliary Feedwater	3		1,2
Component Cooling Water	(3)		(1)
Saltwater Cooling			
Diesel Generator	3		2
Gaseous Nitrogen			
Containment Ventilation			2

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			1
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			3
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)		(3),J	1,J

SUMMARY

	1,3,(3),J	1,2,(1,3),J

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		1	
480 V (AC)		1,2	
120 V (AC)		2	
125 V (DC)			
SUMMARY		1,2	

SHUTDOWN SYSTEM CREDITED :Dedicated

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :yes(SEE TEXT)
Spurious Operation :yes(SEE TEXT)

NOTES

- (3)10B:C&(1)80B:C in 11A

FIRE AREA/ZONE 1-YD-20-4A

Location

Yard - El. 20'-0" - East Penetration Area - 1758 square feet - Figs. 8-A and 8-B.

Combustible Material	Quantity
Cable insulation	3398 lbs
Plastic	40 lbs

Fire loading - 24,918 Btu/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - E/1375°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1375°F and would involve cable insulation and plastic.

The maximum credible fire in this zone is limited by the large floor area and the localized nature of the combustible loading.

The fire loading is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

Fixed temperature rate compensated heat detectors, located at electrical penetration boxes, and ionization smoke detectors, located within the area, provide early warning alarm in the ESO office and control room. Ultraviolet detectors, located at the breezeway entrances to the sphere enclosure building, provide additional early warning alarm in the ESO office and control room. Manual fire fighting equipment is available within the zone, in the adjacent penetration area (1-YD-20-4B), and in zone 1-PB-20-11A.

Construction

This zone is separated from containment (1-CO-(-10)-1) by the steel containment sphere. The portion of the south wall adjoining the 4160V switchgear room (1-PB-14-8) is 3 hour rated. The wall adjoining the chemical

Construction (contd)

feed area in the turbine building ground floor (1-TB-8-9A) is 1 hour rated. An automatic wet pipe sprinkler system protects the turbine building wall and provides equivalent 3 hour protection for the penetration area from a fire in the lube oil reservoir area. The wall common with 1-PB-20-11A is non-rated reinforced concrete with a minimum thickness of 1 foot. The enclosure building wall, which separates the penetration zone from the yard zone (1-YD-14-4D), is non-rated reinforced concrete construction with an approximate thickness of 3 feet. The zone is open to the yard area.

Non-rated doors access the health physics area (1-PB-20-11A) and the yard area (1-YD-14-4D).

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC):	Train 1:	Power cable:	Bus 1C
480V (AC):	Train 1:	Power cable:	Switchgear 3
	Train 2:	Control cable:	Switchgear 4
120V (AC):	Train 2:	Power cable:	Vital Bus 5 (Y29)
			Inverter 5 (YV29)

Reactor Coolant System (RCS):

Train 1: Power cable: Pressurizer Heater Group A&C
Neutron Source Range Flux NE-1201
NE-1202

Control Cable: PORV CV-545
CV-546
PORV Block Valve CV-530
CV-531

Instrumentation cable: NE-1201
NE-1202

Cold Leg Temperature TE-402C
TE-422C
TE-3412C

Hot Leg Temperature TE-2401A
TE-2412A
TE-2422A

Pressurizer Pressure PT-430
PT-431

Pressurizer Level LT-431

Train 2: Instrumentation cable: Hot Leg Temperature
TE-3402A
TE-3411A
TE-3421A

Pressurizer Pressure PT-425

Volume Control and Charging (VCC):

Train 1: Power cable: MOV-1100E
Control cable: MOV-1100E

Train 2: Instrumentation cable: RCP Seal Flow Pressure
PT-1115B
PT-1115C

Equipment Required for Hot Standby (contd)

Main Steam (MSS):

Train 1: Steam Dump Valves: CV-76 (SV-85)
CV-78 (SV-87)
Control cable: CV-76 (SV-85)
CV-78 (SV-87)
Instrumentation cable: S/G Level LT-2400A
LT-2400B
LT-2400C

Train 2: Instrumentation cable: S/G Level LT-3400A
LT-3400B
LT-3400C

Train 3: Safety Valves RV-1
RV-3
RV-5
RV-7
RV-9
Piping valves

Auxiliary Feedwater (AFW):

Train 1: Control Cable: Pump G-10S
AFW Flow Control Valve FCV-2300 A,B&C

Train 2: Control cable: AFW Flow Control Valve FCV-3300 A,B&C
Pump G-10 W
AFW Pump discharge valve FV-3110

Train 3: Piping

Containment Ventilation (CVS):

Train 2: Power cable: Reactor Cavity Cooling Fan A-9S
Control cable: A-9S
Control Damper PO-12

Diesel Generator (DG):

Train 2: Instrumentation cable: Exciter Cabinet E09
Control cable: Diesel Control Panel C-40

Equipment Required for Cold Shutdown

Residual Heat Removal (RHR):

Train 1:	Power cable:	Pump G-14A RHR Inlet Isolation Valve MOV-813 RHR Discharge Isolation Valve MOV-833 RHR HX Inlet Isolation Valve MOV-822A
	Control cable:	MOV-813 MOV-833 MOV-822A

High/Low Pressure Interface Equipment

Reactor Coolant System (RCS):

Train 1:	Control cable:	Reactor Vessel Vent Valve SV-2401 SV-2402 Pzr High Point Vent Valve SV-2403 SV-2404
Train 2:	Control cable:	Reactor Vessel Vent Valve SV-3401 SV-3402 Pzr High Point Vent Valve SV-3403 SV-3404

Volume Control and Charging (VCC):

Train 1:	Control cable:	Seal Water Return Isolation Valve CV-527 Letdown Containment Isolation Valve CV-525

Spurious Operation Equipment

Reactor Coolant System (RCS):

Train 1:	Power cable:	Pump G-2C
Train 2:	Power cable:	Pump G-2B

Volume Control and Charging (VCC):

Train 1:	Control cable:	CV-525
	Instrument cable:	VCT Level LT 2550
Train 2:	Control cable:	Letdown Orfice Isolation Valves CV-202 CV-203 Letdown Isolation Valve LCV-1112

Spurious Operation Equipment (contd)

Safety Injection (SIS):

Train 3: Control cable: Safety Injection Recirc Valve MOV-358

Containment Spray and Recirculation (CRS):

Train 1: Control cable: Containment Spray Control Valve
CV-82
CV-114

Alternate Shutdown Equipment

Reactor Coolant System (RCS):

Train 1: Instrumentation cable: RCS Delta T TE-2400C
TE-412C
TE-420C
TE-410A
TE-420A

Safety Injection (SIS):

Train 3: Power cable: Safety Injection Discharge Valve MOV-850C
Control cable: MOV-850C

Component Cooling Water (CCW):

Train 1: Control cable: RCP Thermal Barrier Pump G-964
Thermal Barrier Coil Return Valves CV-722B
CV-722C

Train 3: Piping and Valves

Dedicated Shutdown Equipment

Post Accident Sampling (PAS):

Train J: Reactor Coolant Inlet Isolation Valve CV-2023
Power Cable: CV-2023

Reactor Cycle Sampling System (RSS):

Train 1: Control Cable: PASS Sample Valve CV-956
Train J: RCS Sample supply isolation Valve SV-3302
Power cable: SV-3302
Control cable: SV-3302
Instrumentation cable: SV-3302

Safety Related Equipment Not Required for Safe Shutdown

Feedwater (FWS):

Train 1:	Power cable:	LT-455	
	Instrumentation cable:		LT-455

Reactor Coolant System (RCS):

Train 1:	Control cable:	CV-951	
		CV-953	
		CV-955	
Train 2:	Control cable:	CV-992	
	Instrumentation cable:		NE-1213

Main Feedwater (MFW):

Train 2:	Control cable:	CV-142
		CV-143
		CV-144

Volume Control and Charging (VCC):

Train 2:	Control cable:	CV-304
		CV-305

Main Steam (MSS):

Train 1:	Instrumentation cable:	FT-462

Cable: Train 1 and Train 2

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figures 8-A and 8-B, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for portions of the train 1 4160V and trains 1 and 2 480V electrical systems may occur. Dedicated shutdown will be utilitzed for a fire in this zone.

Damage to cabling for vital bus 5 and inverter 5 may occur. This may result in the loss of RCS instrumentation and turbine driven auxiliary feedwater pump valves. Dedicated shutdown system instrumentation and west (dedicated) auxiliary feedwater pump circuits are not affected and will be available for shutdown. Manual operator action will be taken to manually position auxiliary feedwater flow control valves.

RCS Damage to cabling for PORVs and associated block valves may occur. Operator action will be taken to deenergize power to the valves. Spurious actuation of the PORVs, until operator action is taken to deenergize and close the valves, has been evaluated and determined to be acceptable. Cables for

Effects of Fire on Hot Standby Capability (contd)

dedicated shutdown system operation of one PORV and block valve from the dedicated shutdown panel are routed outside this fire zone and will remain available.

Damage to cabling for pressurizer heater groups A and B may occur. Cables for dedicated shutdown system operation of pressurizer heater group D are routed outside the fire zone and will remain available.

Damage to cabling for the train 1 source range flux monitors NE-1201 and NE-1202 may occur. During operation of the dedicated shutdown system, shutdown margin will be determined by sampling primary system boron concentration.

Damage to cabling for train 1 and 2 RCS instrumentation may occur. Dedicated shutdown instrumentation will be used for shutdown. Operator action will be taken to deenergize power to prevent spurious operation of pressurizer heaters and pressurizer spray control valves due to spurious pressurizer pressure instrumentation signals. Spurious operation of the pressurizer spray valves will not affect safe shutdown since the reactor coolant pumps are tripped. Pressurizer code safety valves will be available for over-pressure protection. One PORV will be available for system pressure control after dedicated shutdown system operation is initiated.

VCC Damage to cabling for Train 1 Charging Isolation Valve may occur.

Damage to cabling for the train 2 charging control valve may occur. Operator action will be taken to close the charging flow control valve from the dedicated shutdown panel.

Damage to cabling for the RCP seal flow pressure transmitters could cause spurious operation of seal water control valves. Operator action will be taken to fail open the seal injection flow control valves, verify closed the seal water supply valves, and control seal injection flow using manual valve located upstream of the charging flow control valve. Interruption of seal injection and seal cooling to the RCP seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

MSS Damage to cabling for the atmospheric steam dump valves CV-76 and 78 may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious operation of the valves until operator action is taken has been evaluated and determined to be acceptable.

Damage to cabling for the control room steam generator level instrumentation may occur. The corresponding dedicated shutdown instrumentation will remain available.

Damage to steam generator safety valves and steam generator piping is not expected to occur as these components are not susceptible to fire.

AFW Damage to cabling for Train 1 and Train 2 auxiliary feedwater pumps may occur. Dedicated shutdown cables for the west auxiliary feedwater pump are routed outside this fire zone and will remain available.

Effects of Fire on Hot Standby Capability (contd)

Damage to cabling for the auxiliary feedwater flow control valves may occur. Operator action will be taken to isolate instrument air and manually control the valves. Loss of auxiliary feedwater flow, until operator action is taken to initiate flow from the dedicated shutdown system, has been evaluated and determined to be acceptable.

CVS Damage to cabling for the reactor cavity cooling fan and associated damper may occur. The fans are required only to support operation of the source range monitors. During dedicated shutdown system operation, shutdown margin will be determined by sampling primary system boron concentration.

DG Normal diesel generator system operation is not required for dedicated shutdown system operation.

Effects of Fire on Cold Shutdown Capability

RHR Damage to cabling for the RHR pump and associated valves may occur. The west (dedicated) auxiliary feedwater pump and associated cables are routed outside this fire zone and will remain available for single phase cooldown.

Effects of Fire on High/Low Pressure Interface Equipment

RCS Damage to cabling for the reactor vessel vent valves and pressurizer high point vent valves may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious actuation of the vent valves, until operator action is taken to deenergize and close the valves, has been evaluated and determined to be acceptable.

VCC Damage to cabling for the train 1 letdown containment and seal water return isolation valves may occur. The train 2 valves and associated cables are located outside this fire zone and will remain available.

Consequences of Spurious Operation

RCS Damage to cabling for reactor coolant pumps G-2B and G-2C may cause spurious operation of the pumps. Turbine trip will deenergize these pumps.

VCC Damage to cabling for the train 1 letdown containment isolation valve may cause spurious operation of the valve. The train 2 valve is located outside this fire zone and will remain available.

Damage to cabling for the train 2 letdown isolation and orfice isolation valves may cause spurious operation of the valves. Charging path via the RWST will remain available.

Damage to cabling for G8B Low VCT Level Trip could trip the pump. Dedicated Shutdown System power to G8A can be utilized.

FIRE AREA/ZONE: 1-YD-20-4B

AREA: 2514 sq.ft. **DESCRIPTION:** WEST PENETRATION AREA

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	5882 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	29949 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1500
Fire Duration	0.37 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	2
Portable Extinguishers	(2)4A:40B:C,(1)16B:C & (2)10B:C in 24 #
Detectors (Type)	heat, ionization, ultraviolet

FIRE RESISTANCE RATING

- Walls	NR-Steel/1, 1hr/9A, HC others
- Floors,Ceiling or Roof	no roof
- Fixed Openings	OP/4A,4C,4D
- Penetrations	NC,ND,NP/4D
- Doors(UL Class/Zone #)	(2)NR/24, (2)A/4D, NR/4D

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			1,2,(1)
Volume Control & Charging		3	1,2,J*
Main Steam	J*	1,3	1,2,J*
Auxiliary Feedwater		3	1,2
Component Cooling Water			1,(1)
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			2
Containment Ventilation			1,2

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			1,2
Component Cooling Wtr (to RHR)			1

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			1,2
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			J*
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			J

SUMMARY

EQUIPMENT	PIPING VALVES	CABLE
J*	1,3	1,2,(1,2),J*

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)		2	
125 V (DC)			
SUMMARY		2	

SHUTDOWN SYSTEM CREDITED :Dedicated

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :yes(SEE TEXT)
Spurious Operation :yes(SEE TEXT)

NOTES
= (1)4A:40B:C-24

FIRE AREA/ZONE 1-YD-20-4B

Location

Yard - El. 20'-0" - West Penetration Area - 2514 square feet - Figs. 8-A and 8-B.

Combustible Material	Quantity
Cable insulation	5,882 lbs

Fire loading - 29,949 Btu/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - E/1500°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1500°F and would involve cable insulation.

The maximum credible fire in this zone is limited by the large floor area and the localized nature of the combustible loading.

The fire loading is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

Fixed temperature rate compensated heat detectors, located at electrical penetration boxes, and ionization smoke detectors, located within the area, provide early warning alarm in the ESO office and control room. Ultraviolet detectors, located at the breezeway entrances to the sphere enclosure building, provide additional early warning alarm in the ESO office and the control room. Heat detectors are also installed at cable trays near the boundary between zones 4B and 4D for early warning. Manual fire fighting equipment is available within the zone, in the adjacent penetration area (1-YD-20-4A) and in area 1-VN-20-24. No automatic fire suppression systems are provided in this zone. The water spray system protecting the cable trays at the boundary of zones 4B and 4D prevents propagation of fire between the zones.

Construction

This zone is separated from containment (1-CO-(-10)-1) by the steel containment sphere. The wall adjoining the chemical feed area in the turbine building ground floor (1-TB-8-9A) is 1 hour rated. An automatic wet pipe sprinkler system protects the turbine building wall and provides equivalent 3 hour protection for the penetration area from a fire in the lube oil reservoir area. Concrete block walls, with an approximate thickness of 8 inches, separate the zone from the ventilation building (1-VN-20-24). The enclosure building wall, which separates the penetration area from the yard area (1-YD-14-4D), is non-rated reinforced concrete construction with an approximate thickness of 3 feet. The zone is open to the yard area at walkways.

Two 3 hour rated doors open from the enclosure building to the yard area (1-YD-14-4D). A barred, non-rated metal door separates the area from an above grade platform in the yard area. Two non-rated doors communicate with the ventilation equipment room (1-VN-20-24). Ventilation duct penetrations are not provided with fire dampers.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

120V (AC): Train 2: Power cable: Vital Bus 5 (Y29)
Inverter 5 (YV29)

Reactor Coolant System (RCS):

Train 1: Power cable: Neutron Source Range Flux NE-1202
Control cable: PORV CV-545
PORV Block Valve CV-531
Instrumentation cable: Cold Leg Temperature
TE-402C
Neutron Source Range
Flux NE-1202

Train 2: Power cable: Pressurizer Heater Group B & D
Instrumentation cable: Pressurizer Heater
Group A and B
Hot Leg Temperature
TE-3402A
TE-3411A
TE-3421A
Pressurizer Level
LT-435

Volume Control and Charging (VCC):

Train 1: Power cable: Pump G-8B
Lube Oil Pump G-943
RWST Charging Isolation Valve
MOV-1100B

Equipment Required for Hot Standby (contd)

Volume Control and Charging (VCC):

Train 1: Control cable: G-943
MOV-1100B
MG-8BF
Charging Flow Control Valve FCV-1112
Instrumentation cable: Charging Flow FT-1112

Train 2: Control cable: Pump G-8A
Seal Injection Flow Control Valve FCV-1115A
FCV-1115B
FCV-1115C
Lube Oil Pump G-942
Lube Oil Cooling Fan MG-8AF
Instrumentation cable: RCP Seal Flow Pressure
PT-1115A
PT-1115C
Volume Control Tank
Level LT-1100

Train 3: Piping and valves

Main Steam (MSS):

Train 1: Steam Dump Valves CV-77 (SV-86)
CV-79 (SV-88)
Control cable: CV-77 (SV-86)
CV-79 (SV-88)
S/G Blowdown Control Valve
CV-100/100B

Train 2: Instrumentation cable: S/G Level LT-3400A
LT-3400B
LT-3400C

Train 3: Safety Valves RV-2
RV-4
RV-6
RV-8
RV-10
Piping and valves

Train J: Alternate Steam Dump Control at C-38 SV-175

Auxiliary Feedwater (AFW):

Train 1: Power cable: AFW Pump Discharge Valve MOV-1202
Control cable: Pump G-10S
AFW Flow Control Valve FCV-2300 A,B&C
MOV-1202

Train 2: Control cable: AFW Flow Control Valve FCV-3300 A,B&C

Equipment Required for Hot Standby (contd)

Auxiliary Feedwater (AFW):

Train 3: Piping

Component Cooling Water (CCW):

Train 1: Power cable: Pump G-15A
CCW Heat Exchanger Outlet Valve MOV-720B
Control cable: MOV-720B
Train 3: Piping and valves

Containment Ventilation (CVS):

Train 1: Power cable: Reactor Cavity Cooling Fan A-9
Control cable: A-9
Reactor Cavity Cooling Fan Control Damper PO-11
Train 2: Control cable: Reactor Cavity Cooling Fan A-9S

Gaseous Nitrogen (GNI):

Train 2: Control cable: PORV Nitrogen Supply Control Valve CV-532

Equipment Required for Cold Shutdown

Residual Heat Removal (RHR):

Train 1: Power Cable: RHR HX E21A Inlet Valve MOV-822A
Control cable: RHR Flow Control Valve HCV-602
Instrumentation cable: RHR Inlet Temperature TE-600
RHR HX Discharger Temperature TE-601A
TE-601B
Train 2: Power cable: Pump G-14B
RHR Inlet Isolation Valve MOV-814
RHR HX Inlet Isolation Valve MOV-822B
RHR Discharge Isolation Valve MOV-834
Control cable: MOV-814
MOV-822B
MOV-834

Component Cooling Water (CCW):

Train 1: Control cable: CCW Flow Control Valve TCV-601A
TCV-601B

High/Low Pressure Interface Equipment

Reactor Coolant System (RCS):

Train 2: Control cable: Reactor Vessel Valve SV-3401
SV-3402
Pzr High Point Valve SV-3403
SV-3404

Volume Control and Charging (VCC):

Train 2: Control cable: Seal Water Return Isol Valve CV-528
Letdown Containment Isolation Valve CV-526

Spurious Operation Equipment

Reactor Coolant System (RCS):

Control cable: Reactor Coolant Pump G-2A
Pzr Spray Valve PCV-430C
PCV-430H

Volume Control and Charging (VCC):

Train 1: Instrument cable: VCT Level LT 2550

Train 2: Control cable: Test Pump G-42
Primary Water Makeup Control Valve FCV-1102A
Boric Acid Pump Discharge Control Valve FCV-1102B
Boric Acid Supply Control Valve CV-334

Seal Water Supply Valve
FCV-1115D
FCV-1115E
FCV-1115F
CV-526
Chemical Blending Control Valves CV-406A
CV-406B
Letdown Orifice Isolation Valve CV-204
RCS Excess Letdown to RHR Isolation Valve CV-414
Demineralizer Bypass Valve TCV-1105
Letdown Flow to Radwaste Valve LCV-1100A
Low Pressure Letdown Valve PCV-1105

Auxiliary Feedwater (AFW):

Train 1: Power cable: AFW Bypass Isolation MOV-1204
Control cable: MOV-1204

Spurious Operation Equipment (contd)

Containment Spray and Recirculation (CRS):

Train 1: Control cable: Containment Spray Control Valve CV-114

Safety Injection System (SIS):

Train 1: Control cable: Safety Injection Recirc Valve MOV-356

Train 2: Control cable: Safety Injection Recirc Valve MOV-357

Alternate Shutdown Equipment

Reactor Coolant System (RCS):

Train 1: Instrumentation cable: RCS Delta T TE-400A
TE-2400C

Component Cooling Water (CCW):

Train 1: Control cable: Thermal Barrier Coil Control Valve CV-722A

Safety Injection (SIS):

Train 1: Power cable: Pump G-50B
Safety Injection Discharge Valve MOV-850B
Control cable: MOV-850B

Train 2: Power cable: Safety Injection Discharge Valve MOV-850A
Control cable: MOV-850A

Dedicated Shutdown Equipment

Reactor Coolant System (RCS):

Train J: Instrumentation cable: Pzr Level LT-430A
Pzr Pressure PT-434A
Hot Leg Temperature
TE-402A
TE-422A
TE-412A

Dedicated Shutdown Equipment (contd)

Reactor Coolant System (RCS):

Train J:	Instrumentation cable:	Cold Leg Temperature	TE-402B
			TE-412B
			TE-422B
Train 1:	Control cable:	PORV Block Valve CV-530	
		PORV CV-546	

Volume Control and Charging (VCC):

Train 1:	Control cable:	Charging Flow Control Valve FCV-1112

Main Steam (MSS):

Train J:	Instrumentation cable:	S/G Level	LT-450C
			LT-451C
			LT-452C
	Control cable:	Alternate Steam Dump Control at C-38 SV-175	

Reactor Cycle Sampling System (RSS):

Train J:	Power cable:	RCP Sample Supply Isolation Valve SV-3302
	Control cable:	SV-3302
	Instrumentation cable:	SV-3302

Safety Related Equipment Not Required for Safe Shutdown

Reactor Coolant System:

Train 1:	Control cable:	CV-951
		CV-953
		CV-955
Train 2:	Control cable:	CV-992

Auxiliary Feedwater:

Train 2:	Instrumentation cable:	FTH-3453
		FTL-3453
		FTH-3454
		FTL-3454
		FTH-3455
		FTL-3455

Main Steam (MSS):

Train 1:	Instrumentation cable:	FT-460
		FT-461

Safety Related Equipment Not Required for Safe Shutdown (contd)

Feedwater (FWS):

Train 3: Instrumentation cable: LT-453
LT-454

Power cable: LT-453
LT-454

Cable: Train 1 and Train 2

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figures 8-A and 8-B, sheet 3.

Cable for the following systems is wrapped with a 3 hour rated barrier:

Dedicated shutdown system instrumentation cables
Pressurizer heater group D dedicated shutdown cables
Solenoid valve and control cables for alternate steam dump control

Effects of Fire on Hot Standby Capability

EES Damage to cabling for vital bus 5 may occur resulting in the loss of RCS instrumentation and turbine driven auxiliary feedwater pump valve control. Dedicated shutdown system instrumentation and west (dedicated) auxiliary feedwater pump will remain available for shutdown. Manual operator action will be required to position auxiliary feedwater flow control valves.

RCS Damage to cabling for the train 1 PORV and PORV block valve may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation of PORV and associated block valve. Spurious operation of the PORVs until operator action is taken has been evaluated and determined to be acceptable.

Damage to cabling for pressurizer heater groups A and B may occur. Cables for dedicated shutdown system operation of pressurizer heater group D are wrapped with a 3 hour rated barrier and will remain available.

Damage to cabling for train 1 source range flux monitor NE-1202 may occur. During operation of the dedicated shutdown system, shutdown margin will be determined by sampling primary system boron concentration.

Damage to cabling for the train 1 and train 2 RCS instrumentation may occur. Cables for dedicated shutdown instrumentation are wrapped with a 3-hour rated barrier and will remain available.

Effects of Fire or Hot Standby Capability (contd)

VCC Damage to cabling for the train 1 and 2 charging pump and lube oil cooling system may occur. Cables for dedicated shutdown system operation of the train 2 charging pump and associated support equipment are located outside this fire zone and will remain available.

Damage to cabling for RWST charging isolation valve may occur. The RWST charging isolation bypass valve and RWST isolation valve will be available to provide a charging suction path.

Damage to cabling for charging flow control valve and charging flow transmitter may occur. Operator action will be taken to position the flow control valve from the dedicated shutdown panel.

Damage to cabling for RCP seal injection flow control valves and pressure transmitters could cause spurious operation of the valves. Operator action will be taken to fail open the seal injection flow control valves, verify closed the sealwater supply valves, and control seal injection flow using manual valve located upstream of the charging flow control valve. Interruption of seal injection and seal cooling to the RCP seals for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

Damage to cabling for the volume control tank level transmitter is not expected. The circuit is protected with a one hour rated fire barrier.

MSS Damage to cabling for the atmospheric steam dump valves may cause spurious operation of the valves. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious operation of the valves until operator action is taken has been evaluated and determined to be acceptable.

The solenoid valve and associated cabling for alternate steam dump control at the dedicated shutdown panel is protected with a 3 hour rated barrier and will remain available.

Damage to cabling for steam generator level instrumentation may occur. The corresponding dedicated shutdown instrumentation is protected with a 3 hour rated barrier in this fire zone and will remain available.

Damage to cabling for the steam generator blowdown control valve may occur. Operator action will be taken to close manual valves located upstream of the control valve. Spurious actuation of the valve until operator action is taken has been analyzed and determined to be acceptable.

Damage to steam generator safety valves and steam generator piping is not expected to occur as these components are not susceptible to fire.

AFW Damage to cabling for the Train 1 motor driven auxiliary feedwater pump may occur. Dedicated shutdown cables for the west auxiliary feedwater pump are located outside this fire zone and will remain available.

Effects of Fire or Hot Standby Capability (contd)

Damage to cabling for auxiliary feedwater flow control valves may occur. Operator action will be taken to isolate instrument air and manually control the valves. Loss of auxiliary feedwater flow, until operator action is taken to initiate flow from the dedicated shutdown system, has been evaluated and determined to be acceptable.

CCW Damage to cabling for the train 1 CCW pump and associated valves may occur. CCW system operation is not required for dedicated shutdown system operation. Interruption of seal cooling and seal injection to the RCP for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be acceptable.

CVS Damage to cabling for the reactor cavity cooling fans may occur. The fans are required only to support operation of the source range monitors. During dedicated shutdown system operation, shutdown margin will be determined by sampling primary system boron concentration.

GNI Damage to cabling for the PORV nitrogen supply control valve may occur. Operator action will be taken to open the manual bypass valve to supply nitrogen for dedicated shutdown operation of PORVs and block valves.

Effects of Fire on Cold Shutdown Capability

RHR Damage to cabling for train 2 RHR pump and train 1 and 2 RHR valves may occur. The dedicated auxiliary feedwater pump will remain available for single phase cooldown.

CCW Damage to cabling for the CCW flow control valves may occur. The CCW system is not required to support dedicated shutdown system single phase cooldown.

Effects of Fire on High/Low Pressure Interface Equipment

RCS Damage to cabling for reactor vessel vent valves and pressurizer high point vent valves may occur. Operator action will be taken to deenergize power to prevent/mitigate spurious operation. Spurious actuation of the vent valves, until operator action is taken to deenergize and close the valves, has been evaluated and determined to be acceptable.

VCC Damage to cabling for the train 2 letdown containment isolation valve may occur. The train 1 isolation valve and associated cables are located outside this fire zone and will remain available.

Damage to cabling for the train 2 seal water return isolation valve may occur. The train 1 isolation valve and associated cables are located outside this fire zone and will remain available.

Consequences of Spurious Operation

RCS Damage to cabling for the reactor coolant pump and pressurizer spray valves may cause spurious operation of these components. Turbine trip will deenergize the reactor coolant pumps.

Consequences of Spurious Operation (contd)

VCC Damage to cabling for the charging system test pump may cause spurious operation of the pump. Operator action will be taken to trip offsite and diesel generator power.

Damage to cabling for G8B Low VCT Level Trip could trip the pump. Dedicated Shutdown System power to G8A can be utilized.

Damage to cabling for the train 2 primary makeup control valve, boric acid pump discharge control valve, and boric acid supply control valve may cause spurious operation of these valves. Operator action will be taken to deenergize power and close manual valves downstream of makeup control valve and upstream of boric acid supply control valve to prevent/mitigate spurious operation.

Damage to cabling for letdown demineralizer valves may cause spurious operation of the valves. Operator action will be taken to close manual valve located downstream of makeup control valve.

Damage to cabling for the train 2 seal water supply valves may cause spurious operation of the valves. Operator action will be taken to deenergize power to prevent/mitigate spurious operation.

Damage to cabling for the train 2 letdown orifice isolation, RCS excess letdown to RHR isolation, demineralizer bypass, letdown flow to radwaste, and the low pressure letdown valves may cause spurious operation. Charging suction path via the RWST will remain available.

AFW Damage to cabling for the auxiliary feedwater bypass isolation valve may cause spurious operation of the valve. The dedicated auxiliary feedwater pump and its associated cables are located outside this fire zone and will remain available.

CRS Damage to cabling for the refueling water pump may occur. This will result in the loss of power to the pump. The pump is not required to operate during shutdown.

Damage to cabling for the containment spray valve may cause spurious operation of the valve. Operator action will be taken to close manual valve located upstream. Inadvertent spray will not be initiated since refueling water pumps are not spuriously actuated in this zone.

SIS Damage to cabling for the safety injection recirculation valves may occur. The valves will fail in their required safe shutdown position.

Effects of Fire on Alternate Shutdown Equipment

RCS Damage to cabling for alternate shutdown RCS temperature indication may occur. This instrumentation is not credited for shutdown in this fire zone.

CCW Damage to cabling for the thermal barrier coil control valve may cause spurious operation. Interruption of seal cooling and seal injection to the RCP for the period required to initiate seal injection from the dedicated shutdown system has been evaluated and determined to be exceptable.

SIS Damage to cabling for the train 1 safety injection pump and train 1 and 2 safety injection recirculation valves may occur. Operator action will be taken to deenergize the pump to prevent spurious operation. The valves will fail in their required safe shutdown position.

Effects of Fire on Dedicated Shutdown Equipment

RCS Instrumentation cables routed in this fire zone are protected with 3 hour rated barriers, thereby protecting the cables from the effects of fire.

VCC Control cables routed in this zone are protected with 3 hour rated barriers, thereby protecting the cables from the effects of fire.

MSS Instrumentation cables routed in this fire zone are protected with 3 hour rated barriers, thereby protecting the cables from the effects of fire.

RSS Damage to cabling for the RCS Sample isolation valve may occur. Operator action will be taken to open the manual bypass to the valve to sample primary system boron concentration.

Conclusions

The ionization and ultraviolet detection systems provide adequate coverage and are expected to detect a fire in its initial stages of growth and alert the ESO office and the control room. Additional detection coverage is provided by fixed temperature, rate compensated heat detectors installed on electrical sphere penetration boxes. The water spray system in fire zone 4D is expected to prevent the propagation between zones 4B and 4D. Firefighting equipment is available in this zone and adjacent zones. The localized fire loading and lack of available paths for the travel of fire, heat, and products of combustion, in addition to the detection and suppression capabilities will insure that the fire is not able to spread beyond the boundary of the subject fire zone.

The dedicated shutdown system is credited for this area. This system is designed to achieve cold shutdown due to the potential loss of normal shutdown systems. The NRC has reviewed and approved the use of the dedicated shutdown equipment for this area. An exemption to the requirements of 10CFR50 Appendix R, Section III.G.3 has been granted for partial area detection and lack of suppression.

FIRE AREA/ZONE: 1-YD-20-4C

AREA: 215 sq.ft. **DESCRIPTION:** DOGHOUSE

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	10 lbs.
Class A	10 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	1014 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	E/375
Fire Duration	0.01 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	None
Hose Stations	hydrants on fire main
Portable Extinguishers	none - (2) 4A:40B:C in 4B
Detectors (Type)	ultraviolet

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	NR-Steel/1,HC/roof
- Fixed Openings	OP/4B
- Penetrations	NP,NC/4D
- Doors(UL Class/Zone #)	None

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging	1	1,2	1,2,J
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen		2	2
Containment Ventilation			2

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			1
Component Cooling Wtr (to RHR)			1

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

EQUIPMENT	PIPING VALVES	CABLE
1	1,2,	1,2,J

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			
SUMMARY			

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :yes(SEE TEXT)
Spurious Operation :yes(SEE TEXT)

FIRE AREA/ZONE 1-YD-20-4C

Location

Yard - El. 20'-0" - Doghouse - 215 square feet - Fig. 8-A and 8-C.

Combustible Material	Quantity
Cable Insulation	10 lbs
Clothing	10 lbs

Fire loading - 1014 Btu/sq ft
Maximum permissible fire loading - 40,000 Btu/sq ft
Heat Rate - E/375°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 375°F and would involve cable insulation and clothing.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the area.

Fire Protection Equipment

No automatic fire suppression or manual fire fighting equipment is provided within the zone. An ultraviolet detection system protects the doghouse and provides early warning in the ESO office and control room. Manual fire fighting equipment is available in adjacent zone 1-YD-20-4B.

Construction

The walls of the zone are reinforced concrete construction, approximately 2'-3" thick. The ceiling is also of reinforced concrete construction approximately 2'-0" thick. There are numerous non-rated penetrations in the west wall of the zone communicating to zone 1-YD-14-4D. A gate provides access to zone 1-YD-20-4B.

Equipment Required for Hot Standby

Volume Control and Charging (VCC):

Train 1: Charging Flow Control Valve FCV-1112
Charging Loop A Flow Transmitter FT-1112
Control cable: FCV-1112
Instrumentation Cable FT-1112
Piping and Valves

Train 2: Seal Injection Flow Control Valve
FCV-1115A
FCV-1115B
FCV-1115C
Control Cable: FCV-1115A
FCV-1115B
FCV-1115C
Piping and Valves

Equipment Required for Hot Standby (contd)

Containment Ventilation (CVS):
Train 2: Control cable: Reactor Cavity Cooling Fan A-9S

Gaseous Nitrogen (GNI):
Train 2: PORV Nitrogen Supply Control Valve CV-532
Control cable: CV-532

Equipment Required for Cold Shutdown

Residual Heat Removal (RHR)
Train 1: Power cable: RHR HX E-21A Inlet Valve MOV-822A

Component Cooling Water (CCW):
Train 1: Control cable: CCW Flow Control to RHR HX E-21A TCV-601A
Train 2: Control cable: CCW Flow Control to RHR HX E-21B TCV-601B

High/Low Pressure Interface Equipment

Volume Control and Charging (VCC):
Train 2: Seal Water Return Isolation Valve CV-528
Control Cable: CV-528

Spurious Operation Equipment

Volume Control and Charging (VCC):
Train 2: Letdown Containment Isolation Valve CV-526
RCS Excess Letdown to RHR Isolation Valve CV-414
Low Pressure Letdown Valve PCV-1105
Control cable: CV-526
Seal Water Supply Valve FCV-1115D
FCV-1115E
FCV-1115F
Control Cable: FCV-1115D
FCV-1115E
FCV-1115F
CV-414
PCV-1105

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

Volume Control and Charging (VCC):
Train 1: Control cable: Charging Flow Control Valve FCV-1112

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figures 8-A and 8-C, sheet 3.

Effects of Fire on Hot Standby Capability

VCC Damage to charging flow control valve and flow transmitter cables may occur. Operator action will be taken to close manual valves located upstream for charging through the seal injection flow path.

Damage to cabling for RCP seal injection flow control may occur. Operator action will be taken to fail open the seal injection flow control valves, verify closed the seal water supply valves, and control seal injection flow using manual valves located upstream of the charging flow control valve.

CVS Damage to the train 2 reactor cavity cooling fan may occur. The train 1 reactor cavity cooling fan will remain available.

GNI Damage to the PORV nitrogen supply control valve may occur. Operator action will be required to open manual bypass valve to provide nitrogen if PORV or block valve operation is required.

Effects of Fire on Cold Shutdown Capability

RHR Damage to the Train 1 RHR Heat Exchanger Inlet Valve Power Cable may occur. During normal operation the Train 1 or Train 2 valve is in the open position with its power locked out. The RHR Flow Control Valve is available to control flow.

CCW Damage to Train 1 & 2 Temperature Control Valves may occur. If required, the operator will verify valve position and control flow by using manual valves located down stream.

Effects of Fire on High/Low Pressure Interface Equipment

VCC Damage to the train 2 seal water return isolation valve may occur. The train 1 isolation valve and its associated cables are located outside this fire zone and will remain available.

Consequences of Spurious Operation

VCC Damage to the train 2 letdown containment isolation valve may cause spurious operation of the valve. The train 1 isolation valve and its associated cables are located outside this fire zone and will remain available.

Damage to seal water supply valves may cause spurious operation of the valve. Operator action will be taken to verify closed seal water supply valves and to verify open seal injection flow control valves.

Damage to RCS excess letdown to RHR isolation and low pressure letdown valves may cause spurious operation of these valves. Charging suction path via the RWST will remain available.

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

VCC Damage to dedicated shutdown charging flow control valve cables may occur. Dedicated shutdown cables and equipment are not utilized for shutdown in this zone.

Conclusions

The low combustible loading and fire detection capabilities within this zone and suppression capabilities in adjacent area/zones will insure that the fire is limited to this fire zone.

Safe shutdown equipment within this fire zone may be lost as a result of a fire. The redundant safe shutdown equipment credited for this zone has been demonstrated to remain available for safe shutdown due to the fire protection features provided and spatial separation. An exemption to the requirements of 10CFR50 Appendix R, Section III.G.2.b has been granted for the lack of suppression and detection.

FIRE AREA/ZONE: 1-YD-14-4D

AREA: 33555 sq.ft. **DESCRIPTION:** YARD AREA

COMBUSTIBLES

Oil & Grease	54126 lbs.
Cable (30% Fill)	6649 lbs.
Class A	4113 lbs.
Charcoal	0 lbs.
Plastics	917 lbs.
Miscellaneous	9197 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	38104 BTU's/sq.ft.
Fire Loading - Max Permissible	160000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1500
Fire Duration	0.48 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	Waterspray/transformers & west wall FH bld
Hose Stations	(3),(1) in 9A,4A,4B,hydrants in yard
Portable Extinguishers	(1)10B:C (2)160B:C (4)10A:60B:C (1)4A:40BC
Detectors (Type)	ultraviolet/transformers,heat/SSD trays

FIRE RESISTANCE RATING

- Walls	2hr/7, HC, CB, NR-STEEL/1
- Floors,Ceiling or Roof	no roof
- Fixed Openings	OP,MH,CH,OD/2N,2I,2F,4A,4B,OH/2E M/2E,#
- Penetrations	P,C,D,NP,NC,ND
- Doors(UL Class/Zone #)	A/7,4B, A/2G,NR/24,4B,2A,2C,2D,2H,2L,2P, 1,28,9A

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			2
Volume Control & Charging	2,3	2	1*,2,3,1,2,J
Main Steam		1	J,1
Auxiliary Feedwater		1,2,3,J	1,2
Component Cooling Water	1,2	1,2	1,2
Saltwater Cooling		3	1,2
Diesel Generator			
Gaseous Nitrogen	X,(X),1,2		
Containment Ventilation			2

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			1
Component Cooling Wtr (to RHR)		1	1

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)	1,2		1,2
Auxiliary Saltwater Cooling			2

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			J*,1,2
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			J,1

SUMMARY	123,X,(X)	1,2,3,J	123,J,J*,1*2*

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		1,2	
480 V (AC)	1,2	1,2,J	
120 V (AC)		2	
125 V (DC)			
SUMMARY	1,2	1,2,J	

SHUTDOWN SYSTEM CREDITED :Alterante - single phase cooldown, Charging

ASSOCIATED CIRCUITS OF CONCERN **NOTES**

H/L Pressure Interface :yes(SEE TEXT) #-LV/24,2D,2L

Spurious Operation :yes(SEE TEXT)

FIRE AREA/ZONE 1-YD-14-4D

Location

Yard - El. 14'-0" - Yard Area - 33,555 square feet - Fig. 8-A, 8-C.

Combustible Material	Quantity
Lubricating oil	6,499 gals
Transformer oil	801 gals
Grease	6 gals
Cable insulation	6,649 lbs
Class A combustibles	4,113 lbs
Plastic	917 lbs
Miscellaneous combustibles	827 lbs

Fire loading - 38,104 Btu/sq ft
Maximum permissible fire loading - 160,000 Btu/sq ft (Note 1)
Heat Rate - E/1500 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials. Combustible load is localized and removed from the vicinity of safe shutdown equipment in the zone.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Note 3: Seal welded hydrogen piping routed within the zone.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1500 °F and would involve oil, grease, cable insula- tion, Class A combustibles, plastic, and miscellaneous combustibles.

The maximum credible fire in this zone is limited by the large floor area and the localized nature of the combustible loading. The design basis fire is expected to be limited to a fire in the vicinity of one of the following hazards: station service transformers 2 and 4, station service transformer 1 & 3, the dirty and clean lube oil storage tanks, or at the component cooling water pumps.

The fire loading is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

Ultraviolet flame detectors are located locally over station transformers 1, 2, and 4. Detector actuation results in ESO office and control room annunciation and actuation of an automatic water spray system, providing local coverage for the transformers.

Station transformers are provided with curbs to limit possible spread of transformer oil.

Heat detectors are located locally over cable at the boundary between zones 4B and 4D trays . Detector actuation results in ESO office and control room annunciation and actuation of an automatic water spray system, providing local coverage for the cable trays.

Manual fire fighting equipment is available within the zone, and in adjacent fire zones 1-YD-20-4A, 1-YD-20-4B, and 1-TB-8-9A. In addition, hose streams are available from yard hydrants.

Construction

The zone consists of the yard area west of the sphere enclosure, fuel handling, and turbine buildings, and is bounded by the vital area fence. Nonrated doors open from the zone to the turbine building ground floor (1-TB-8-9A), the reactor auxiliary building (1-AB-(-3)-2A, 1-AB-20-2C, 1-AB-20-2D, 1-AB-20-2H, 1-AB-20-2L, 1-AB-20-2P), the ventilation building (1-VN-20-24), and the P.A.S.S. control compartment (1-YD-7-28). A barred nonrated door separates the enclosure building (1-YD-20-4B) from an above grade platform in the zone. A nonrated personnel escape hatch communicates with containment (1-CO-(-10)-1). A two hour rated wall separates this zone from the 480V switchgear room (1-FH-14-7). The zone is separated from the 480V switchgear room (1-FH-14-7), the penetration area (1-YD-20-4B), and the resin slurry tank room (1-AB-20-2G) by 3 hour rated doors. Open walkways provide access to zones 1-YD-20-4A and 1-YD-20-4B.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC):	Train 1:	Power cable: Bus 1C Control cable: Bus 1C
	Train 2:	Power cable: Bus 2C Control cable: Bus 2C
480V (AC):	Train 1:	Station Service Transformer 1 & 3 Power cable: Switchgear 1 & 3
	Train 2:	Station Service Transformer 2 Power cable: Switchgear 2 MCC-2A Station Service Transformer 4 Power cable: Switchgear 4 MCC-4
120V (AC):	Train 2:	Power cable: Vital Bus 5 (Y29)

Equipment Required for Hot Standby (contd)

Reactor Coolant System (RCS):

Train 2: Power cable: Pressurizer Heater Group B & D

Volume Control and Charging (VCC):

Train 1: Control cable: Charging Flow Control Valve FCV-1112
RWST Charging Isolation Valve MOV-1100B
Lube Oil Cooling Fan MG-8BF
MOV-1100E
Power cable: Lube Oil Pump G-943
Pump G-8B
MG-8BF
MOV-1100E
Instrumentation cable: FT-1112

Train 2: Power cable: Pump G-8A
RWST Charging Isolation Valve MOV-1100D
Control cable: Lube Oil Pump G-942
Lube Oil Cooling Fan MG-8AF
Volume Control Tank Isolation Valve MOV-1100C
Seal Injection Flow FCV-1115A
FCV-1115B
FCV-1115C
G-8A
MOV-1100D
RCP Seal Water Filters C-42
C-42S
Piping and Valves

Train 3: Refueling Water Storage Tank D-1
RWST Isolation Valve MOV-883
Power cable: RWST Isolation Valve MOV-883
Control cable: MOV-883

Main Steam (MSS):

Train 1: Steam generator blowdown valve CV-100/100B
Power cable: CV-100/100B

Auxiliary Feedwater (AFW):

Train 1: S/G Flow Control Valve: FCV-2300 A,B&C
Power cable: AFW Pump Discharge Valve MOV-1202

Equipment Required for Hot Standby (contd)

Auxiliary Feedwater (AFW) (contd):

Train 1: Control cable: Pump G-10S and Pump G-10
MOV-1202
FCV-2300 A,B&C
Train 2: S/G Flow Control Valve FCV-3300 A,B&C
Control cable: FCV-3300 A,B&C
G-10W
FV-3110
Train 3: Piping and valves

Component Cooling Water (CCW):

Train 1: Pump G-15A
Heat Exchanger E-20B
Heat Exchanger Inlet Valve MOV-720B
Power cable: G-15A
MOV-720B
Control cable: MOV-720B
Piping and valves
Train 2: Pump G-15B
Heat Exchanger E-20A
Heat Exchanger Inlet MOV-720A
Power cable: G-15B
MOV-720A
Control cable: MOV-720A
Piping and valves
Pump G-15C
Surge Tank C-17
Power cable: G-15C
Piping and valves

Saltwater Cooling (SWC):

Train 1: Power cable: Pump G-13A
Control cable: G-13A
Train 2: Power cable: Pump G-13B
Control cable: G-13B
Train 3: Piping and valves

Equipment Required for Hot Standby (contd)

Containment Ventilation (CVS):
Train 2: Control cable: Reactor Cavity Cooling Fan A-9S

Gaseous Nitrogen (GNI): Nitrogen Bottles:

For SV-2620, 2614	C-1036 C-1037
For CV-545, 546	C-1038 C-1039
For FCV-2300A,B&C	C-1043 C-1298 through C-1308
For FCV 3300A,B&C	C-1040 through C-1042 C-1044 through C-1047 C-1293 through C-1297
For CV-113	C-1204 through C-1213

Equipment Required for Cold Shutdown

Component Cooling Water (CCW):

Train 1: RHR Heat Exchanger Control Valve TCV-601A, TCV-601B
Control cable: TCV-601A
TCV-601B

Residual Heat Removal (RHR)
Train 1: Power cable: RHR HX E21A Control Valve MOV-822A

High/Low Pressure Interface Equipment

Reactor Coolant System (RCS):

Train 2: Control cable: Reactor Vessel Vent SV-3401, SV-3402
Pzr High Point Vent SV-3403, SV-3404

Volume Control and Charging (VCC):
Train 1: Instrument cable: VCT Level LT 2550

Train 2: Power cable: Seal Water Return Isolation Valve CV-528
Letdown Containment Isolation Valve CV-526

Spurious Operation Equipment

Volume Control and Charging (VCC):

Train 2:	Control cable:	Test Pump G-42
		Boric Acid Supply Control Valve CV-334
		Primary Water Backup Control Valve FCV-1102A
		Boric Acid Pump Discharge Control Valve FCV-1102B
		Chemical Blending Control Valves CV-406A
		CV-406B
		RCS Excess Letdown to RHR Isolation Valve CV-414
		Demineralizer Bypass Valve TCV-1105
		Letdown Flow to Radwaste Valve LCV-1100A

Main Steam System (MSS):

Train J:	Control Cable:	Alternate Condenser Steam Dump Control at C-38 SV-176

Auxiliary Feedwater (AFW):

Train 1:	Power cable:	AFW Bypass Isol Valve MOV-1204
	Control cable:	MOV-1204

Containment Spray and Recirculation (CRS):

Train 1:	Refueling Water Pump G-27N
Train 2:	Refueling Water Pump G-27S

Safety Injection (SIS):

Train 2:	Power cable:	Safety Injection Recirc Valve MOV-357
	Control cable:	MOV-357
Train 3:	Power cable:	Safety Injection Recirc Valve MOV-358
	Control cable:	MOV-358

Alternate Shutdown Equipment

Safety Injection (SIS):

Train 1: Safety Injection Pump G-50B
RWST Lo-Lo Level Trip Switches: LSL-2215
LSL-2216
LSL-2217
Power cable: Safety Injection Discharge Valve MOV-850B
G-50B
Control cable: MOV-850B
G-50B
Instrumentation cable: LSL-2215
LSL-2216
LSL-2217

Train 2: Safety Injection Pump G-50A
RWST Lo-Lo Level Trip Switches: LSL-3088
LSL-3089
LSL-3090
Power cable: G-50A
Control cable: G-50A
Instrumentation cable: LSL-3088
LSL-3089
LSL-3090

Gaseous Nitrogen (GNI):

Nitrogen Bottles for SIS Valves C-1030
C-1031
C-1032
C-1033
C-1034
C-1035

Aux Salt Water Cooling (SWC):

Train 2: Control Cable: Aux Swc Pump G-13C
Power Cable: Aux Swc Pump G-13C

Dedicated Shutdown Equipment

Essential Electrical Systems (EES):

Train 2: Power cable: MCC 4A

Reactor Coolant System (RCS):

Train J: Instrumentation Cable: Pzr Level LT-430A
Pzr Pressure PT-434A
Cold Leg Temp TE-402B
TE-412B
TE-422B
Hot Leg Temp TE-422A
TE-412A
TE-402A

Train 1: Control cable: PORV Block Valve CV-530
PORV CV-546
Train 2: Power cable: Pzr Heater Group D

Volume Control & Charging (VCC)

Train J: Control Cable: Charging Flow Control Valve FCV-1112

Dedicated Shutdown Equipment (contd)

Post Accident Sampling (PAS):

Train J: Control cable: Reactor Coolant Inlet Isol Valve Valve CV-2023
Power cable: CV-2023

Reactor Cycle Sampling System (RSS):

Train 1: Control cable: Pass Sample Valve CV-956
Train J: Power cable: RCS Sample Supply Isol Valve SV-3302
Instrumentation cable: SV-3302
Control cable: SV-3302

Main Steam (MSS):

Train J: Instrumentation cable: S/G Level LT-450C
LT-451C
LT-452C

Safety Related Equipment Not Required for Safe Shutdown

Reactor Coolant System:

Train 2: Control cable: CV-992

Main Feedwater:

Train 1: Control cable: CV-142
CV-143
CV-144

Spent Fuel Pit Pump G-5

Spent Fuel Pit Heat Exchanger E-12

Gaseous Nitrogen:

Nitrogen Backup Supply for: TCV-601A
TCV-601B
FCV-1115D
FCV-1115E
FCV-1115F
HCV-602

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figures 8-A and 8-C, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to station service transformers 1, 2, 3 and 4, and associated 4160V and 480V cables is not credible due to the large separation between transformers 1 and 3 and transformers 2 and 4 and the detection/suppression systems protecting them. The station service transformers are separated by approximately 150 feet, including 40 feet without intervening combustibles. The extremely large spatial separation between station service transformer 1 and 3 and station service transformers 2 and 4 will allow the train 1 480V electrical system to remain available if the train 2 480V electrical system is damaged by fire, or allow the train 2 480V electrical systems to remain available if the train 1 480V electrical system is damaged by fire. Operator action to deenergize the charging pumps from the control room if letdown is lost and the volume control tank isolation valve remains open will be required as a result of damage to motor control center 2A power cables. Operator action to close the reheater isolation valves will be required as a result of damage to motor control center 4 power cables.

Loss of train 2 120V power cables would result in the loss of power to vital bus 5 loads. Redundant RCS hot leg temperature and steam generator level instrumentation is located outside this fire zone and remain available. The west (dedicated) auxiliary feedwater pump and its associated valves will remain available. Operator action will be required to manually position auxiliary feedwater control valves.

RCS Damage to cabling for pressurizer heater groups B and D may occur. Pressurizer heater groups A and C will remain available.

VCC Damage to cabling for train 2 charging pump and associated support equipment may occur. The train 1 equipment and cables are separated by over 20 feet with no intervening combustible and protected with a 1 hour rated barrier and will not be affected by the fire. Cables for dedicated shutdown operation of train 2 charging pump and associated support equip- ment is routed outside this fire zone and will also remain available.

Damage to RWST isolation valve may occur. The RWST isolation valve will fail as is, in the open position, as required for safe shutdown.

Damage to the RWST charging isolation, and volume control tank isolation valves may cause spurious operation. If the VCT isolation and RWST charging isolation valves fail close, the RWST charging isolation bypass valve will remain available. If the VCT isolation valve fails open, letdown flow or the train 2 charging pump low VCT trip will remain available.

Damage to the volume control tank level transmitter cabling is not expected since it protected with a one hour fire rated barrier in this area.

Effects of Fire on the Hot Standby Capability (contd)

Damage to charging flow control valve cables may occur. Manual operator action will be required to close manual valves located upstream of charging flow control valve for charging through the seal injection flowpath.

Damage to cabling for seal water supply valves may occur. Operator action will be taken to fail open the seal injection flow control valves. Seal water supply valves will be verified closed and seal injection flow will be controlled using manual valves located upstream of the charging flow control valve.

Damage to reactor coolant pump seal water filters and refueling storage tank is not credible as they contain no components susceptible to fire.

MSS Damage to steam generator blowdown isolation valves my occur. Operator action will be taken to deenergize the valves.

AFW Damage to cabling for remote operation of the auxiliary feedwater pump and associated valves is expected. Operator action will be required to start pump G10S at 480V switchgear 3, manually open discharge valve, and manually control auxiliary feedwater flow control valves. Loss of auxiliary feedwater flow until the operator actions are completed has been evaluated and determined to be acceptable.

CCW Damage to CCW pumps and associated valves may occur. The component cooling water pumps are not required to support CCW operation if single phase cooldown is being used.

SWC Damage to cables for train 1 and 2 saltwater cooling pumps may occur. The auxiliary saltwater pump will remain available to support CCW operation if single phase cooldown is not utilized. Saltwater cooling is not required to support single phase cooldown.

CVS Damage to the train 2 reactor cavity cooling fan may occur. The train 1 reactor cavity cooling fan will remain available.

GNI Damage to nitrogen supplies to valves in this fire zone is not expected as they have no components which could be affected by fire.

Effects of Fire on Cold Shutdown Capability

CCW Damage to CCW temperature control valves for RHR heat exchangers may occur. Operation of manual valves located downstream of temperature control valves to control CCW flow to the RHR heat exchangers would be utilized if RHR cooldown is available. If single phase cooldown is to be used, no actions are required since neither RHR or CCW operation would be required.

RHR Damage to Train 1 RHR heat exchanger inlet valve power cable may occur. This valve is not required for single phase cooldown. Train 1 or 2 inlet valve has its power locked out in the open position during normal operation should single phase cooling not be used.

Effects of Fire on High/Low Pressure Interface Equipment

RCS Damage to cabling for reactor vessel vent valves and pressurizer high point vent valves may occur. Disconnect switches are provided in the penetration area to deenergize and close the vent valves. Spurious actuation of these valves, until operator action is taken to close them, has been evaluated and determined to be acceptable.

VCC Damage to cabling for train 2 seal water return and letdown containment isolation valve may occur. The train 1 isolation valves and their associated cables are located outside this zone and will remain available.

Consequences of Spurious Operation

VCC Damage to cabling for the charging system test pump may cause spurious operation of the pump. Operator action will be taken to deenergize the pump. Spurious actuation of this pump, until operator action has been taken, has been evaluated and determined to be acceptable.

Damage to cabling for G8B Low VCT Level Trip could trip the pump. Dedicated Shutdown System power to G-8A can be utilized.

Damage to cabling for boric acid system control valves may cause spurious operation of the valves. Operator action will be taken to close manual valves upstream of the charging flow control valve. Spurious actuation of this equipment, until operator action has been taken, has been evaluated and determined to be acceptable.

Damage to cabling for the RCS excess letdown to RHR isolation, demineralizer bypass, and letdown flow to radwaste valves may cause spurious operation of these valves. Charging suction path via the RWST will remain available.

MSS Damage to cabling for condenser steam dump valve may cause loss of dedicated shutdown system valve control. Manual control of the condenser steam dump valve is not affected.

AFW Damage to cabling for the auxiliary feedwater bypass isolation valve may occur. The valve will fail in its required safe shutdown position.

CRS Damage to cabling for the refueling water pumps may cause spurious operation of the pumps. The loss of these pumps will not impact the ability to achieve and maintain safe shutdown since they are not required to operate for safe shutdown.

SIS Damage to cabling for the safety injection recirculation isolation valves would divert flow from the seal injection flow path to the safety injection flow path. The effects of the spurious actuation have been evaluated and determined to be acceptable.

Effects of Fire on Alternate Shutdown Equipment

SIS Damage to safety injection pumps and associated discharge valves may occur. This equipment is not credited for safe shutdown in this zone.

Effects of Fire on Alternate Shutdown Equipment (contd)

GNI Nitrogen bottles for safety injection valves in this zone do not contain components which are susceptible to fire. In addition, SIS operation is not required for a fire in this zone.

SWC Cables for Aux Saltwater Cooling are routed in embedded conduit. Adequate separation from redundant components exists.

Effects of Fire on Dedicated Shutdown Equipment

EES Damage to cabling for the dedicated shutdown panel may occur. This equipment is not credited for safe shutdown in this zone.

RCS Damage to RCS power control and instrumentation cabling for dedicated shutdown system may occur. This equipment is not credited for safe shutdown in this zone.

Damage to cabling for post accident sampling and reactor cycle sampling valves may occur. The source range neutron flux monitor will remain available for determination of shutdown margin.

MSS Damage to cabling for dedicated shutdown system S/G level instrumentation may occur. This equipment is not credited for safe shutdown in this zone.

VCC Control cables for the Charging Flow Control Valves are normally deenergized and used for DSD operation only.

Conclusions

The ultraviolet detection system located at the transformers is expected to detect the fire in its initial stages of growth, and alert the ESO office and control room. Activation of the ultraviolet detectors will automatically actuate the water spray system installed over the transformers. The heat detectors located over the cable trays at the boundary between zones 4B and 4D are expected to detect the fire in its initial stage of growth, and alert the ESO office and control room. The water spray system providing local coverage for the cable trays prevents propogation of fire between zones 4D and 4B. The lube oil in the lube oil storage tanks is contained and will not present an exposure hazard to any safe shutdown equipment.

One train of redundant or alternate safe shutdown systems necessary to achieve and maintain hot and cold shutdown conditions from the control room or emergency control stations (location of required manual actions) will be free of fire damage in accordance with 10CFR50 Appendix R, Section III.G.1. The wide separation of both combustibles and redundant safe shutdown or alternate shutdown equipment in addition to the detection and suppression capabilities will insure that the fire is limited to either one train of safe shutdown or alternate shutdown systems and that manual actions will be initiated within the required time intervals. Alternate shutdown is also credited for a fire in this zone. An exemption to the requirements of 10CFR50 Appendix R, section III.G.3 has been granted for partial area detection and suppression.

FIRE AREA/ZONE: 1-YD-(-7)-4E

AREA: 2945 sq.ft. **DESCRIPTION:** CIRCULATING WATER PUMP WELL

COMBUSTIBLES

Oil & Grease	166 lbs.
Cable (30% Fill)	0 lbs.
Class A	35 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	1265 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	E/500
Fire Duration	0.02 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 9A, (1) in 4D, #
Portable Extinguishers	(1)10A:60B:C
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC/floor,no roof
- Fixed Openings	OP/4D
- Penetrations	NP,NC
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling	1,2	1,2,3	1,2
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

	1,2	1,2,3	1,2

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			
SUMMARY			

SHUTDOWN SYSTEM CREDITED :Alternate:SWC

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

NOTES

= hydrants on fire main

FIRE AREA/ZONE 1-YD-(-7)-4E

Location

Yard - El. (-7'-6") - Circulating Water Pump Well - 2945 square feet - Fig. 8-C.

Combustible Material	Quantity
Gasoline	27 gals
Class A combustibles	35 lbs

Fire loading - 1,265 Btu/sq ft
Maximum permissible fire loading - 13,000 Btu/sq ft
Heat Rate - E/500 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The gasoline identified above is located in a tank in zone 1-YD-14-4K. See writeup in 1-YD-14-4K for evaluation of effects of gasoline on that zone.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 500 °F and would involve gasoline and Class A combustibles.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic fire suppression or detection systems are provided in the zone. Manual fire fighting equipment is available within the zone, and in adjacent zones 1-YD-14-4D and 1-TB-8-9A. In addition, hose streams are available from yard hydrants.

Construction

The zone is entirely below grade. No roof is provided. Staircases on the north and south walls of the pump well provide access to the zone.

Equipment Required for Hot Standby

Saltwater Cooling (SWC):

Train 1: SWC Pump G-13A
Power cable: G-13A
Control cable: G-13A
Piping and valves
Train 2: SWC Pump G-13B
Power cable: G-13B
Control cable: G-13B
Piping and valves
Train 3: Piping and valves

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone of the barriers requiring surveillance refer to Figure 8-C, sheet 3.

Effects of Fire on Hot Standby Capability

SWC

Damage to the train 1 and train 2 saltwater cooling pumps may occur. The auxiliary saltwater cooling pump and cables are located outside the fire zone and will remain available.

Damage to saltwater cooling piping and valves is not postulated to occur as a result of the design basis fire, as there are no components in the zone which could be adversely affected by the fire.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

Safe shutdown equipment within this fire zone may be lost as a result of a fire thereby requiring that alternate safe shutdown equipment outside this fire zone be kept free from fire damage.

The minimal fire loading and available paths for dissipation of heat and products of combustion in addition to the available suppression capabilities will ensure that the fire is not capable of simultaneously damaging both redundant saltwater pumps and the auxiliary saltwater pump. One train of redundant or alternate safe shutdown systems necessary to achieve and maintain hot and cold shutdown conditions from the control room or emergency control stations (location of required manual actions) will be free of fire damage in accordance with 10CFR50 Appendix R, Section III.G.1. An exemption to the requirements of 10CFR50 Appendix R, Section III.G.3 has been granted for lack of area wide suppression and detection.

FIRE AREA/ZONE: 1-YD-14-4F

AREA: 5114 sq.ft. **DESCRIPTION:** CONDENSATE STORAGE TANK AREA

COMBUSTIBLES

Oil & Grease	98120 lbs.
Cable (30% Fill)	1971 lbs.
Class A	2166 lbs.
Charcoal	0 lbs.
Plastics	100 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	110 lbs.

DESIGN BASIS FIRE

Fire Loading	372098 BTU's/sq.ft.
Fire Loading - Max Permissible	380000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1950
Fire Duration	4.65 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) ea. in 9A,9B, hydrants on main
Portable Extinguishers	(4)4A:40B:C, (1)10B:C & (2)10A:60B:C in #
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	CB/9A
- Floors,Ceiling or Roof	HC/floor,no roof
- Fixed Openings	OP/9A
- Penetrations	NC,9A,ND/9A
- Doors(UL Class/Zone #)	NR/9A, B/9A

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			3
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

			3

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		1,2	
480 V (AC)		3	
120 V (AC)			
125 V (DC)			
SUMMARY		1,2,3	

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no

Spurious Operation :yes(SEE TEXT)

NOTES

- 9A

FIRE AREA/ZONE 1-YD-14-4F

Location

Yard - El. 14'-0" - Condensate Storage Tank Area - 5114 square feet - Fig. 8-A.

Combustible Material	Quantity
Lubricating oil	2,650 gals
Transformer oil	10,496 gals
Cable insulation	1,971 lbs
Class A combustibles	2,166 lbs
Plastic	100 lbs
Hydrogen	21,000 c.f.

Fire loading - 372,098 Btu/sq ft
Maximum permissible fire loading - 380,000 Btu/sq ft
Heat Rate - E/1950 °F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Note 2: The quantity of cable insulation called out above is based on 30% fill for all cable trays that are filled with cable up to 30% full by volume. For cable trays that are more than 30% full, the actual percentage fill has been used. This is extremely conservative, since very few trays are filled to greater than 30% and the actual plant average tray fill is significantly lower.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1950 °F and would involve oil, hydrogen, cable insula- tion, Class A combustibles, plastic.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic fire suppression or detection systems are provided in the zone. Manual fire fighting equipment is available within the zone, and in adjacent zones 1-TB-8-9A, and 1-TB-35-9B. In addition, hose streams are available from yard hydrants.

Construction

The zone consists of the condensate storage tank area outside the south end of the turbine building. The zone is separated from the turbine building ground floor by nonrated concrete block walls. The south and west boundaries of the zone are delineated by the vital area fence. A 1-1/2 hour rated door allows access to the turbine building (1-TB-8-9A) from the zone. A welded shut, nonrated door exists in the wall separating the zone from 1-TB-8-9A.

Equipment Required for Hot Standby

Essential Electric Systems (EES):

4160V (AC):	Train 1:	Control cable:	Bus 1C
	Train 2:	Control cable:	Bus 2C
480V (AC):	Train 2:	Power cable:	MCC 4

Volume Control and Charging (VCC):

Train 3:	Power cable:	RWST Isolation Valve MOV-883
	Control cable:	RWST Isolation Valve MOV-883

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

Safety Injection (SIS):

Train 3:	Control cable:	Safety Injection Recirc Valve MOV-358

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

None

Safety Related Equipment Not Required for Safe Shutdown

Essential Electric Systems:

4160V(AC):	Train 2:	Auxiliary Transformer C
480V (AC):	Train 2:	Transformer X-22 (12kV SDG and E Intertie)
		Power cable: 12kV SDG and E intertie

Technical Specification Barriers

For area/zone of the barriers requiring surveillance refer to Figures 8-A, sheet 3.

Effects of Fire on Hot Standby Capability

EES Damage to cabling for portions of the 4160V electical system may result in a loss of offsite power. Operator action will be required to energize the 4160V buses from the diesel generators.

Damage to cabling for MCC 4 may occur. The valves affected will fail to their required safe shutdown position.

VCC Damage to cabling for the RWST isolation valve may occur. The valve will fail as is, in the open position, as required for safe shutdown.

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

SIS Damage to cabling for safety injection recirculation valve may cause spurious operation of the valve. Spurious operation of this valve will not impact charging system operation and is therefore acceptable.

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

None

Conclusions

Safe shutdown equipment within this fire zone may be lost as a result of a fire. The redundant safe shutdown equipment credited for this zone has been demonstrated to remain available for safe shutdown due to the fire protection features provided and spatial separation. An exemption to the requirements of 10CFR Appendix R, Section III.G.2.b has been granted for the lack of suppression and detection.

FIRE AREA/ZONE: 1-YD-14-4G

AREA: 2698 sq.ft. **DESCRIPTION:** DEDICATED SHUTDOWN AREA

COMBUSTIBLES

Oil & Grease	2116 lbs.
Cable (30% Fill)	50 lbs.
Class A	85 lbs.
Charcoal	0 lbs.
Plastics	434 lbs.
Miscellaneous	30 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	18001 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1350
Fire Duration	0.23 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none
Portable Extinguishers	(1)40A:160B:C (6)2A:40B:C
Detectors (Type)	ultraviolet,photoelectric

FIRE RESISTANCE RATING

- Walls	NR
- Floors,Ceiling or Roof	NR
- Fixed Openings	OP/4K,4D
- Penetrations	NP/4D
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			J
Main Steam			J
Auxiliary Feedwater	2		2,J
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			J
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			1,2,J
West Auxiliary Feedwater			J
Post Accident Sampling(PAS/RSS)			
SUMMARY	2	1	1,2,J

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)		1,J	
480 V (AC)		J	
120 V (AC)		(J),J	
125 V (DC)		J	
SUMMARY		1 (J),J	

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no

Spurious Operation :yes(SEE TEXT)

NOTES

(SEE TEXT)

FIRE AREA/ZONE 1-YD-14-4G

Location

Yard - El. 14'-0" Dedicated Shutdown Area - 2698 square feet - Figures 8-A and 8-C.

Combustible Material	Quantity
Cloth	10 lbs
Cable insulation	50 lbs
Plastic	434 lbs
Rubber	30 lbs
Diesel Fuel Oil	1 gal
Lube Oil	285 gal
Wood	75 lbs

Fire Loading - 18,001 Btu/sq. ft.
Maximum Permissible Fire Loading - 40,000 Btu/sq. ft.
Heat Rate - E/1350

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible material.

Note 2: The dedicated shutdown deisel fuel oil storage tank (2,500 gallon capacity) is located below grade, north of the diesel generator enclosure.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 1350°F and would involve cloth, cable insulation, plastic, rubber diesel fuel oil, and wood.

The design basis fire conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

Photoelectric smoke detectors, located in the switchgear and battery storage enclosures, and ultraviolet flame detectors, located in the diesel generator enclosure, provide early warning alarm in the ESO office and control room. No automatic fire suppression equipment is present in the zone. Manual firefighting equipment is available in the zone and in adjacent zone 1-YD-14-4D. Hose streams are available from yard hydrants.

Construction

This zone consists of the dedicated shutdown equipment in the northwest corner of the yard area. The zone is bounded by security fence on all sides. A card key operated gate provides access to the zone from the west side. The battery storage rack, diesel generator, and switchgear utilized for dedicted shutdown are housed in non-rated buildings (enclosures) constructed in the zone. A manhole, covered with a metal hatch, is located north of the diesel generator enclosure. The dedicated shutdown diesel fuel oil storage tank is also north of the diesel generator enclosure below grade.

Equipment Required for Hot Standby

Auxiliary Feedwater (AFW):

Train 2: Motor Driven Pump G-10W
Power Cables: Pump G-10W
Control Cables: Pump G-10W
Pump discharge valve SV-3110

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

Main Steam System (MSS):

Train J: Control cable: Alternate Condensate Steam Dump Control at C-38 SV-176

Alternate Shutdown Equipment (EES):

Essential Electric Systems:

120V (AC):	Train J:	Power cable:	Dedicated Shutdown Panel C-38
	Train J:	Power cable:	Distribution Panel Y47

Dedicated Shutdown Equipment (EES):

Essential Electric Systems:

4160V (AC):	Train J:	Power cable:	Bus A4
		Control cable:	Bus A4
	Train 1:	Power cable:	Bus 1C
480V (AC):	Train J:	Power cable:	B40
			B41
			MCC 4A
			MCC B30A
120V (AC):	Train J:	Power cable:	C-38
	Train J:	Power cable:	Dedicated Shutdown Emergency Lighting Panel LDSD
			YV30
			Y46
			Y49
125V (DC):	Train J:	Power cable:	DSD Battery Charger D26
			DSD DC Bus D28

Reactor Coolant System (RCS):

Train 1: Control cable: PORV Block Valve CV-530
CV-546
Train 2: Power cable: Pressurizer Heater Group D

Auxiliary Feedwater (AFW) Train J: Power Cable: G-10W

Dedicated Shutdown Equipment (contd)

Train J:Instrumentation cable: Pzr Level LT-430A
Pzr Pressure PT-434A
Hot Leg Temperature
TE-402A
TE-412A
TE-422A
Cold Let Temperature
TE-402B
TE-412B
TE-422B

Volume Control and Charging (VCC):

Train 1: Control cable: Charging Flow Control Valve FCV-1112
Train 2:Power cable: Pump G-8A
Lube Oil Cooling Fan MG-8AF
Train J:Control cable: MOV-1100B/D Bypass Valve
FCV-5051

Main Steam System (MSS):

Train J: Instrumentation cable: S/G Level LT-450C

LT-451C

LT-452C

Train J: Control cable: Alternate Steam Dump Control at C-38 SV-175

Auxilliary Feedwater System (AFW):
Train J: Pump G10W

Diesel Generator (DG):
Train J: Power cable: DSD Diesel Generator Exh Fan EF900
DSD Diesel Generator Exh Fan EF901
DSD Fuel Oil Transfer Pump G-990
Control cable: EF900
EF901
G-990

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figures 8-A and 8-C, Sheet 3.

Effects of Fire on Hot Standby Capability

AFW Damage to the Train 2/J Auxiliary Feedwater pump, its associated cables, and cables for the discharge valve may occur. The Train 1 pumps and their associated cables are outside the fire zone and will remain available.

FIRE AREA/ZONE 1-YD-14-4G

Effects of Fire on Cold Shutdown Capability

None

Consequences of Spurious Operation

MSS Damage to control cabling for alternate condenser steam dump control at C-38 may occur. The loss of control for these valves will not impact the ability to achieve and maintain safe shutdown via normal shutdown control.

Effects of Fire on Alternate Shutdown Equipment

ESS Damage to cabling for the normal power for dedicated shutdown 480V and 120V electrical system may occur. The loss of this equipment will not impact the ability to achieve and maintain safe shutdown since normal shutdown equipment remains available.

Effects of Fire on Dedicated Shutdown Equipment

EES Damage to dedicated shutdown equipment and associated control circuits, dedicated shutdown emergency lighting in the zone, and battery charging may occur. The use of this equipment is not credited for safe shutdown in this zone.

RCS Damage to dedicated shutdown cabling for pressurizer heater group D, PORV and block valve may occur. The use of this equipment is not credited for safe shutdown in this zone.

Damage to cabling for dedicated shutdown system power to the west Aux Feedwater pump may occur. The use of this equipment is not credited for safe shutdown in this zone.

VCC Damage to cabling for dedicated shutdown system charging may occur. The use of this equipment is not credited for safe shutdown in this zone.

MSS Damage to cabling for dedicated shutdown system level transmitters may occur. The use of this equipment is not credited for safe shutdown in this zone.

DG Damage to dedicated shutdown system diesel generator may occur. The use of the dedicated diesel generator is not credited for safe shutdown in this zone.

AFW Damage to dedicated shutdown cables for the west AFW Pump may occur. This equipment is not credited for safe shutdown in this fire zone.

Conclusions

The available fire detection is expected to detect the products of combustion and alarm in the ESO and control rooms. The available manual fire fighting equipment in the zone and adjacent zone 1-YD-14-4D, is adequate to suppress the fire.

Normal shutdown is credited for a fire is the zone. A fire spreading beyond the boundaries of this fire zone may propagate into the surrounding fires zones 1-YD-14-4D and 1-YD-14-4K. A fire propagating into the surrounding zones will not be capable of propagation to a fire area/zone crediting dedicated safe shutdown due to large spacial seperation and lack of a path of combustion. This zone contains only dedicated safe shutdown equipment. Therefore, one train of safe shutdown equipment and instrumentation credited for a fire in this zone will remain available in accordance with 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-YD-14-4H

AREA: 7302 sq.ft. DESCRIPTION: HEALTH PHYSICS BUILDING

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	36384 lbs.
Charcoal	0 lbs.
Plastics	1792 lbs.
Miscellaneous	310 lbs.
Miscellaneous Gases	42 lbs.

DESIGN BASIS FIRE

Fire Loading	44680 BTU's/sq.ft.
Fire Loading - Max Permissible	160000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1550
Fire Duration	0.56 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	sprinklers
Hose Stations	None
Portable Extinguishers	(7) 2A:40B:C
Detectors (Type)	None

FIRE RESISTANCE RATING

- Walls	NR
- Floors,Ceiling or Roof	NR
- Fixed Openings	OP\4D,4J
- Penetrations	NC\4J
- Doors(UL Class/Zone #)	NR\4D,4J

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no

Spurious Operation :no

NOTES

Area is combined for 1st & 2nd flr

Added 42# Prop. for 4.3# of Meth.

FIRE AREA/ZONE: 1-YD-14-4I

AREA: 12062 sq.ft. DESCRIPTION: RADWASTE FACILITY

COMBUSTIBLES

Oil & Grease	178 lbs.
Cable (30% Fill)	0 lbs.
Class A	17040 lbs.
Charcoal	0 lbs.
Plastics	970 lbs.
Miscellaneous	162 lbs.
Miscellaneous Gases	10 lbs.

DESIGN BASIS FIRE

Fire Loading	13030 BTU's/sq.ft.
Fire Loading - Max Permissible	160000 BTU's/sq.ft.
Heat Rate (degrees F)	E\1300
Fire Duration	0.16 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	Sprinklers
Hose Stations	none
Portable Extinguishers	(8)2A:40B:C
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	NR
- Floors,Ceiling or Roof	NR,HC\floor
- Fixed Openings	OP\4K
- Penetrations	NC\4K
- Doors(UL Class/Zone #)	NR

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			
SUMMARY			

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no

Spurious Operation :no

NOTES

Phase I&II & common Y/A between

Added 10# Prop. for 1.4# of Meth.

FIRE AREA/ZONE: 1-YD-14-4J

AREA: 55343 sq.ft. **DESCRIPTION:** EAST OUTSIDE YARD AREA

COMBUSTIBLES

Oil & Grease	0 lbs.	
Cable (30% Fill)	0 lbs.	
Class A	0 lbs.	NIL
Charcoal	0 lbs.	
Plastics	0 lbs.	
Miscellaneous	0 lbs.	
Miscellaneous Gases	0 lbs.	

DESIGN BASIS FIRE

Fire Loading	0 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	N/A
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	hose house containing firefighting equip.
Portable Extinguishers	(2)4A:40B:C, (1)80B:C
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	NR\exterior,9D,9A 3hr\PB
- Floors,Ceiling or Roof	NR, no roof
- Fixed Openings	OP/4D,9E LV\17A,B
- Penetrations	see adj. area\zone matrix
- Doors(UL Class/Zone #)	see adj. area\zone matrix

HOT STANDBY SYSTEMS

Reactor Coolant
Volume Control & Charging
Main Steam
Auxiliary Feedwater
Component Cooling Water
Saltwater Cooling
Diesel Generator
Gaseous Nitrogen
Containment Ventilation

EQUIPMENT	PIPING VALVES	CABLE

COLD SHUTDOWN SYSTEMS

Residual Heat Removal
Component Cooling Wtr (to RHR)

EQUIPMENT	PIPING VALVES	CABLE

ALTERNATE SHUTDOWN SYSTEMS

Safety Injection (SIS/MFW)
Auxiliary Saltwater Cooling

EQUIPMENT	PIPING VALVES	CABLE

DEDICATED SHUTDOWN SYSTEMS

Reactor Coolant
West Auxiliary Feedwater
Post Accident Sampling(PAS/RSS)

EQUIPMENT	PIPING VALVES	CABLE

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

4160 V (AC)
480 V (AC)
120 V (AC)
125 V (DC)

EQUIPMENT	CABLE	MCC OR SWITCHGEAR

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE: 1-YD-14-4K

AREA: 73537 sq.ft. **DESCRIPTION:** WEST OUTSIDE YARD AREA

COMBUSTIBLES

Oil & Grease	166 lbs.
Cable (30% Fill)	0 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	47 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	E/200
Fire Duration	0.00 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	hose house containing firefighting equip.
Portable Extinguishers	none
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	NR\exterior,4G,9B,5,6 2hr\7
- Floors,Ceiling or Roof	NR, no roof
- Fixed Openings	OP/4D,4J,9B,4E
- Penetrations	see adj. area\zone matrix
- Doors(UL Class/Zone #)	see adj. area\zone matrix

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling	2	2	2

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

	2	2	2

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			
SUMMARY			

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE 1-YD-14-4K

Location

Yard - El. 20'-0" - West Outside Yard Area - 73537 square feet - Fig. 8-G

Combustible Material	Quantity
Gasoline	27 gallons

Fire loading - 47 Btu/sq. ft.
Maximum permissible fire loading - 13,000 Btu/sq. ft.
Heat Rate - E/200 °F

Design Basis Fire

The design basis fire is postulated to involve gasoline and transient combustibles which may be located in this zone.

The maximum credible fire in this zone is limited by the large floor area and localized nature of the combustible loading.

Fire Protection Equipment

Hose houses containing fire fighting equipment are provided in this zone for use in combatting a fire in the zone.

Construction

The zone comprises the area between the vital area fence and the protected area boundary.

This zone shares boundaries at the vital area fence with yard area Zones 1-YD-20-4G, 1-Yd-14-4D, 1-YD-(-7)-4E, 1-YD-14-4F and 1-YD-14-4J. The zone also shares boundaries with 1-YD-14-4H, 1-YD-14-4L, 1-YD-14-4I, 1-TB-10-9C, 1-TB-8-9A, 1-TB-35-9B and 1-AB-20-2H. The Zone is open on the north and south sides to zone 1-YD-14-4J.

Equipment Required for Hot Standby

None

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

Saltwater Cooling (SWC):

Train 2: Auxiliary Saltwater Cooling
Pump: G-13C
Power cable: G-13C
Control cable: G-13C
Piping and valves

Dedicated Shutdown Equipment

None.

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone of the barriers requiring surveillance refer to Figure 8-G, sheet 3.

Effects of Fire on Hot Standby Capability

None

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

Damage to auxiliary saltwater cooling pump may occur. This pump is not credited for shutdown in this fire zone.

Effects of Fire on Dedicated Shutdown Equipment

None.

Conclusions

The extremely low heat rate and short fire duration resulting from the light combustible loading in this fire area indicates that the propagation of a fire from this fire area to an adjacent fire area is not likely to occur.

A fire in this area does not adversely effect the safe shutdown capabilities of the plant. This fire area is in compliance with 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-YD-14-4L

AREA: 6764 sq.ft. **DESCRIPTION:** MAINTAINENCE BUILDING

COMBUSTIBLES

Oil & Grease	329 lbs.
Cable (30% Fill)	0 lbs.
Class A	95448 lbs.
Charcoal	0 lbs.
Plastics	50 lbs.
Miscellaneous	7196 lbs.
Miscellaneous Gases	10 lbs. Acetylene 150 C.F.

DESIGN BASIS FIRE

Fire Loading	128069 BTU's/sq.ft.
Fire Loading - Max Permissible	160000 BTU's/sq.ft.
Heat Rate (degrees F)	E/1850
Fire Duration	1.60 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	Sprinklers
Hose Stations	None, hydrant in yard area
Portable Extinguishers	(4) 2A:40B:C, (1) 60B:C
Detectors (Type)	None

FIRE RESISTANCE RATING

- Walls	NR
- Floors,Ceiling or Roof	NR
- Fixed Openings	OP/4K
- Penetrations	ND/4K, NC/4K
- Doors(UL Class/Zone #)	NR/4K

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

NOTES

Area shown is combined area for 1st and 2nd floors

FIRE AREA/ZONE: 1-YD-7-27

AREA: 224 sq.ft. **DESCRIPTION:** P.A.S.S. PROCESS COMPARTMENT

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	220 lbs.
Class A	0 lbs.
Charcoal	100 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	18358 BTU's/sq.ft.
Fire Loading - Max Permissible	20000 BTU's/sq.ft.
Heat Rate (degrees F)	B/600
Fire Duration	0.23 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, hydrants on fire main
Portable Extinguishers	none
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	CH/4D, OP/2B
- Penetrations	P, NP/4A
- Doors(UL Class/Zone #)	none

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)		J	
120 V (AC)			
125 V (DC)			
SUMMARY		J	

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE 1-YD-7-27

Location

Yard - El. (7'-0") - P.A.S.S. Process Compartment - 224 square feet - Fig. 8-A.

Combustible Material	Quantity
Cable Insulation	220 lbs.
Charcoal	100 lbs.

Fire loading - 18,358 Btu/sq. ft.
Maximum permissible fire loading - 20,000 Btu/sq. ft.
Heat Rate - B/600°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 600°F and would involve cable insultation and charcoal.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatiac fire suppression, fire detection, or manual fire fighting equipment is available within the area. Hose streams are available from yard hydrants.

Construction

The area is entirely below grade and consists of the Post Accident Sampling System (PASS) Process Room. The walls, floor, and ceiling are concrete construction. A concrete hatch provides access to the area from the yard area (1-YD-14-4D).

Equipment Required for Hot Standby

None

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

Essential Electric Systems (EES): 480(AC) Train 2: Power Cable: MCC 4A

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone of the barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capability

None

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

EES Damage to cabling for train 2 motor control center may occur. The use of this equipment is not credited for safe shutdown in this zone.

Conclusions

The extremely low heat rate and short fire duration resulting from the light combustible loading in this fire area indicates that the propagation of a fire from this fire area to an adjacent fire area is not likely to occur.

Normal shutdown is credited for a fire in this area. The safe shutdown equipment and instrumentation credited for a fire in this area have been demonstrated to remain available for safe shutdown due to the fire barriers and spatial speration provided in accordance with 10CFR50 Appendix R, Section III.G.1.

FIRE AREA/ZONE: 1-YD-7-28

AREA: 162 sq.ft. **DESCRIPTION:** P.A.S.S. CONTROL COMPARTMENT

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	0 lbs.
Class A	15 lbs.
Charcoal	0 lbs.
Plastics	5 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	1241 BTU's/sq.ft.
Fire Loading - Max Permissible	13000 BTU's/sq.ft.
Heat Rate (degrees F)	B/200
Fire Duration	0.02 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, hydrants on fire main
Portable Extinguishers	none
Detectors (Type)	none

FIRE RESISTANCE RATING

- Walls	HC
- Floors,Ceiling or Roof	HC
- Fixed Openings	CH/4D, OP/27
- Penetrations	C,P
- Doors(UL Class/Zone #)	NR/4D

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)		J	J

SUMMARY

		J	J

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)		J	J
120 V (AC)			
125 V (DC)			
SUMMARY		J	J

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :no
Spurious Operation :no

FIRE AREA/ZONE 1-YD-7-28

Location

Yard - El. (7'-0") - P.A.S.S. Process Compartment - 162 square feet - Fig. 8-A.

Combustible Material	Quantity
Cable Insulation	15 lbs.
Plastics	5 lbs.

Fire loading - 1,241 Btu/sq. ft.
Maximum permissible fire loading - 13,000 Btu/sq. ft.
Heat Rate - B/200°F

Note 1: The maximum permissible fire loading is based on an evenly distributed loading of combustible materials.

Design Basis Fire

The design basis fire is postulated to be a fire that reaches a maximum temperature of 200°F and would involve Class A combustibles and plastics.

The design basis fire is conservatively based on the simultaneous total combustion of all combustibles in the zone.

Fire Protection Equipment

No automatic fire suppression, fire detection, or manual fire fighting equipment is available within the area. Hose streams are available from yard hydrants.

Construction

The area is entirely below grade and consists of the Post Accident Sampling System (PASS) Process Room. The walls, floor, and ceiling are concrete construction. A stairway on the west side of the area provides access to the area from the yard area (1-YD-14-4D) through a non-rated door.

Equipment Required for Hot Standby

None

Equipment Required for Cold Shutdown

None

High/Low Pressure Interface Equipment

None

Spurious Operation Equipment

None

Alternate Shutdown Equipment

None

Dedicated Shutdown Equipment

Essential Electric Systems (EES): 480V(AC) Train 2: Motor Control Center 4A: MCC 4A
Power Cable: MCC 4A

Post Accident Sampling (PAS): Power cable: Reactor Coolant Inlet Isolation Valve CV-2023
Control cable: CV-2023

Safety Related Equipment Not Required for Safe Shutdown

None

Technical Specification Barriers

For area/zone barriers requiring surveillance refer to Figure 8-A, sheet 3.

Effects of Fire on Hot Standby Capability

None

Effects of Fire on Cold Shutdown Capability

None

Effects of Fire on High/Low Pressure Interface Equipment

None

Consequences of Spurious Operation

None

Effects of Fire on Alternate Shutdown Equipment

None

Effects of Fire on Dedicated Shutdown Equipment

EES Damage to cabling for train 2 motor control center may occur. This equipment is not credited for safe shutdown in this zone.

PAS Damage to cabling for the reactor coolant inlet isolation valve may occur. This equipment is not credited for safe shutdown in this zone.

Conclusions

The extremely low heat rate and short fire duration resulting from the light combustible loading in this fire area indicates that the propagation of a fire from this fire area to an adjacent fire area is not likely to occur.

Normal shutdown is credited for a fire in this area. The safe shutdown equipment and instrumentation credited for a fire in this area have been demonstrated to remain available for safe shutdown due to the fire barriers and spatial speration provided in accordance with 10CFR50 Appendix R, Section III.G.1.

UNIT 1 VENTILATION BUILDING

The Unit 1 Ventilation Building is a concrete block structure located west of the enclosure building. The ventilation building contains the ventilation equipment for the reactor auxiliary building and the spent fuel pool room. There is no safety related or safe shutdown equipment located within the building.

The Ventilation Building is considered a single fire area.

The types of fire protection/detection equipment in or near the Ventilation Building consist of the following:

- Portable fire extinguishers.
- Manual hose stations.
- Ionization smoke detectors, are provided for property protection and should provide early warning alarm.

Fire Area/Zone	Contains Safe Shutdown Equipment	Contains Safety Related Equipment Not Required for Safe Shutdown	Page No.	Figure No.
1-VN-20-24	No	No	1/VN-1	8-A, 8-C

FIRE AREA/ZONE: 1-VN-20-24

AREA: 781 sq.ft. **DESCRIPTION:** VENTILATION EQUIPMENT ROOM

COMBUSTIBLES

Oil & Grease	0 lbs.
Cable (30% Fill)	170 lbs.
Class A	0 lbs.
Charcoal	0 lbs.
Plastics	0 lbs.
Miscellaneous	0 lbs.
Miscellaneous Gases	0 lbs.

DESIGN BASIS FIRE

Fire Loading	2792 BTU's/sq.ft.
Fire Loading - Max Permissible	40000 BTU's/sq.ft.
Heat Rate (degrees F)	A/200
Fire Duration	0.03 hrs.

FIRE PROTECTION (AVAILABLE)

Suppression (Type)	none
Hose Stations	none, (1) in 4D, (1) in 4B
Portable Extinguishers	(1)16B:C, (2)10B:C, (1)4A:40B:C,#
Detectors (Type)	ionization

FIRE RESISTANCE RATING

- Walls	CB
- Floors,Ceiling or Roof	HC/floor, NR/roof
- Fixed Openings	LV/4D
- Penetrations	C, NP/4B,4D, ND/4B,4D, NC/4B
- Doors(UL Class/Zone #)	NR/4D, (2)NR/4B

HOT STANDBY SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
Volume Control & Charging			
Main Steam			
Auxiliary Feedwater			
Component Cooling Water			
Saltwater Cooling			
Diesel Generator			
Gaseous Nitrogen			
Containment Ventilation			

COLD SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Residual Heat Removal			
Component Cooling Wtr (to RHR)			

ALTERNATE SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Safety Injection (SIS/MFW)			
Auxiliary Saltwater Cooling			

DEDICATED SHUTDOWN SYSTEMS

	EQUIPMENT	PIPING VALVES	CABLE
Reactor Coolant			
West Auxiliary Feedwater			
Post Accident Sampling(PAS/RSS)			

SUMMARY

ESSENTIAL ELECTRIC SYSTEMS

	EQUIPMENT	CABLE	MCC OR SWITCHGEAR
4160 V (AC)			
480 V (AC)			
120 V (AC)			
125 V (DC)			

SUMMARY

SHUTDOWN SYSTEM CREDITED :Normal

ASSOCIATED CIRCUITS OF CONCERN

H/L Pressure Interface :No
Spurious Operation :No

NOTES

#-(1)4A:40B:C in 4B